

3.3 Wildlife

Introduction

This section discloses the direct, indirect, and cumulative effects of the Como Forest Health Project on wildlife and wildlife habitat. Information concerning the existing condition and potential consequences on wildlife and their habitats in the project area and in specific treatment units is presented. This section also provides a scientific and analytical basis for the comparison of the alternatives in Chapter 2.

Habitats and Wildlife Species Analyzed

Twenty wildlife species are listed as threatened, endangered, sensitive, or management indicator species with the potential for habitat on the Bitterroot National Forest. Thirteen of these species and their habitats are analyzed in this section. The yellow-billed cuckoo, proposed for listing as threatened, is not analyzed because it and its habitat do not occur in the project area or on the Bitterroot National Forest. Six sensitive species are not analyzed in detail because their habitats do not occur, and individuals of those species rarely, if ever, occur in the Como Forest Health project area. The six sensitive species not analyzed are bald eagle, bighorn sheep, Coeur d'Alene salamander, northern bog lemming, northern leopard frog, and peregrine falcon. Coeur d'Alene salamanders occur in Rock Creek but the population is disconnected from the project area and there is no suitable habitat in the project area. Peregrine falcon eyries are occupied in Lost Horse and Como drainages but there is no suitable habitat within the project area and vegetation management activities would have no impact on the eyries or individual falcons. Bald eagles have a nest near the southwest end of Lake Como, but it is too far from the project area to be disturbed by project activities.

The thirteen species included in the analysis are:

Threatened, Endangered, or Candidate Species

- .. Canada lynx (threatened)

Sensitive Species

- | | |
|----------------------------|-----------------------------|
| .. Black-backed woodpecker | .. Long-legged myotis (bat) |
| .. Fisher | .. Western big-eared bat |
| .. Flammulated owl | .. Western toad |
| .. Gray wolf | .. Wolverine |
| .. Long-eared myotis (bat) | |

Management Indicator Species

- | | |
|--------------------|------------------------|
| .. American marten | .. Pileated woodpecker |
| .. Elk | |

Old-growth forest and snags are also analyzed as key wildlife habitat components. These habitats are discussed first followed by the individual species. The species analysis follows the same pattern as listed above, starting with threatened and endangered species and ending with management indicator species. The analyses of long-eared myotis, long-legged myotis, and western big-eared bat are combined since their habitats and project effects are similar. Analyses of forest land birds and animal movements, migrations, and dispersal are found at the end of the wildlife section.

Regulatory Framework

The regulatory framework providing direction for the protection and management of wildlife and wildlife habitat for the Como Forest Health Project comes from the following principal sources:

Bitterroot National Forest Plan

The Bitterroot National Forest Plan (USDA Forest Service 1987), in compliance with the National Forest Management Act (NFMA), establishes Forest-wide and management area specific direction, goals, objectives, standards, and guidelines for the management of wildlife species and habitats on the Forest. Direction covers old growth habitat, snags, management indicator species, sensitive species, and threatened and endangered species.

The Bitterroot Forest Plan requires that habitat be provided to support viable populations of native and desirable non-native wildlife, and to maintain habitat for the recovery of threatened and endangered species (USDA Forest Service 1987:II-3). Habitat needs of sensitive species and protection of threatened and endangered species is to be considered in all project planning (USDA Forest Service 1987:II-21). Sensitive species are designated by each Region of the Forest Service according to the occurrence of the species and its habitat within Regional boundaries. Forests are then required to prevent declines in sensitive species populations that might lead to listing under Endangered Species Act (ESA) (FSM 2670.32 (4)).

The Northern Region Regional Forester currently lists the black-backed woodpecker (*Picoides arcticus*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), western big-eared bat (*Corynorhinus townsendii*), fisher (*Martes pennanti*), flammulated owl (*Otus flammeolus*), gray wolf (*Canis lupus*), and western toad (*Bufo boreas*) as sensitive species.

The Bitterroot Forest Plan objective for old growth habitat is to maintain sufficient old growth habitat to support viable populations of old growth dependent species. Largely because of widespread, intensive harvest that occurred in the project area around 1900, many management areas/third order drainage polygons do not meet the Forest Plan old growth standard. Old growth forest habitat requires a percentage of the forest have trees 170 years or older and other components such as snags and coarse woody debris. Much of the area is approaching the age class but will need more time to attain it. Protecting the remaining old growth and managing the forest structure and composition, including the snag and coarse woody debris components, within the historical ranges are the best options to achieve Forest Plan standards.

The Como Forest Health Project proposes treatments in MAs 1, 2, 3a, and 3c. The Bitterroot National Forest Plan provides standards for old growth maintenance in each of these Management Areas. In MA 1, old growth stands should be 40 acres or larger, distributed over the management area. Within each 3rd order drainage, 3% of the suitable timberland will be maintained in old growth. This standard is the same for MAs 2 and 3a, except 8% of the suitable timberland will be maintained in old growth. The standard for MA 3c is slightly different; 8% of non-riparian suitable timberland in each separate piece of MA 3c within each 3rd order drainage will be maintained in old growth. In all MAs, the Forest Plan specifies that patches of old growth habitat should be at least 40 acres and well distributed over the Management Areas. The timber stand is the unit of delineation

for old growth habitat. In practice, if a stand of old growth habitat is less than 40 acres, it is still managed as old growth.

The Bitterroot Forest Plan states, "All snags that do not present an unacceptable safety hazard will be retained" (p. II-20, USDA Forest Service 1987). The Forest Plan Five Year Review (PF-FPMON-002, p. 22, Appendix p. 70) clarifies that the purpose of the 1987 Forest Plan snag standard is to retain some vertical structure in the regenerated forest, in support of the wildlife goals and objectives, while providing a safe working environment. The Forest Plan Five Year Review (p. 22) also states that "In order to meet the intent of the Forest Plan to retain some large vertical woody structure, about two trees per acre are needed..." (Ibid). The Forest Plan standard in old growth habitat is "snags, generally 1.5 per acre greater than 6 inches dbh and 0.5 per acre greater than 20 inches" (p. II-20, USDA Forest Service 1987).

The Bitterroot Forest Plan also provides standards for the retention of modest levels of organic matter, including woody materials 8 inches or less in diameter. For Management Areas (MA) 1, 2, 3a, and 3c, the Forest Plan states "at least 10 to 15 tons per acre of residual debris is needed" on dry and harsh sites (p. III-6) (USDA Forest Service 1987).

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of 25 percent of the big game winter range as thermal cover. Other Forest Plan standards related to maintenance of wildlife populations include standards for the amount and distribution of old growth habitat by management area, retention of snags, maintenance of elk populations and habitat, and management of elk habitat effectiveness through the Travel Management process (USDA Forest Service 1987).

Specifically for elk, the Forest Plan requires:

- Maintaining thermal cover (trees greater than 40 feet tall and greater than 70 percent crown canopy closure) on at least 25 percent of big game winter range
- Maintaining elk habitat effectiveness (EHE), as measured by open road density, at 50 percent for third order drainages that are roaded and 60 percent that are unroaded

National Forest Management Act

The National Forest Management Act (NFMA) requires a balanced consideration of all resources. It requires the Forest Service to plan for a diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives (16 U.S.C. 1604(g) (3)(B)). Under this law, the Forest Service is to manage for viable populations of native and desired non-native species, and to maintain and improve habitat of management indicator species.

Endangered Species Act

Section 7 of the Endangered Species Act (ESA) directs that actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of any threatened or endangered (T & E) species, or result in the adverse modification of habitat designated as critical to these species. The Bitterroot National Forest consults as required with the USFWS concerning the effects of projects on T & E species. In accordance with the requirements of the ESA, the wildlife analysis for this project addresses the direct, indirect, and cumulative effects of the proposed alternatives on threatened and endangered wildlife species, species habitat, individuals, and populations, and ends with

an effects determination for each species. Preliminary effects determinations are then summarized in a Biological Assessment (BA) summary at the end of the wildlife section.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act of 1918 (MBTA) implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the act, it is unlawful to pursue, hunt, take, capture (or kill) a migratory bird except as permitted by regulation (16 U.S.C. 703-704). The regulations at 50 CFR 21.11 prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, or possessing migratory birds, including nests and eggs, except under a valid permit or as permitted in the implementing regulations (Director's Order No. 131). A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle.

While the U.S. Fish and Wildlife Service (FWS) is the lead federal agency for managing and conserving migratory birds in the United States, under Executive Order (EO) 13186, all other federal agencies are charged with the conservation and protection of migratory birds and the habitats on which they depend. In response to this order, the Forest Service has implemented management guidelines that direct migratory birds to be addressed in the NEPA process when actions have the potential to negatively or positively affect migratory bird species of concern.

The USDA Forest Service and the US Fish and Wildlife Service signed the Memorandum of Understanding (MOU) to Promote the Conservation of Migratory Birds in late 2008. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal, and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

Wildlife Habitats

The two key wildlife habitats in the Como Forest Health project area are old growth and snags. These two habitats are analyzed because many of the sensitive species and management indicator species rely on them for part or all of their habitat needs such as nesting, hunting, foraging, and denning. Though snags are a component of old growth forests, they are also components in other forest types so they are analyzed separately.

3.3.1 Old Growth Forest

This part of the wildlife analysis discusses old growth forest conditions and the effects of implementing project alternatives on old growth forest components. The effects of implementing the project alternatives on species associated or dependent upon old-growth habitat are discussed under the marten, pileated woodpecker, black-backed woodpecker, flammulated owl, and fisher headings.

3.3.1.1 Overview of Issues Addressed

Habitat Quantity and Quality

The Forest Service recognizes the many important values associated with old growth forests, such as biological diversity, wildlife and fisheries habitat, recreation, aesthetics, soil productivity and water quality (Green et al. 1992, errata 2005). The Bitterroot Forest Plan addresses the retention of old growth forests within the wildlife management standards.

Although there are many large diameter trees in the Como Forest Health project area, there are very few units that qualify as old growth forest as defined by Green et al. (1992, errata 2005). Most units that appear to qualify as ponderosa pine old growth forest do not have enough trees older than 170 years or with diameters at breast height (DBH) of 20 inches or greater. Many of the stands that do have old growth characteristics are smaller than 40 acres. The Forest Plan allows the regeneration of old growth stands when other stands achieve old growth status. It also allows sanitation and salvage harvests in old growth forests if old growth characteristics are retained after logging (FP II-20). The Forest Service does not propose to regenerate existing old growth stands in the Como Forest Health project. However, the Forest Service does propose intermediate harvests to preserve old growth characteristics from disturbances such as fire and mountain pine beetle infestations, and create stand conditions that will enhance the development of old growth attributes.

Alternative 4, does not treat old growth forest because implementation of the proposed treatments might not preserve all existing old growth characteristics. However, the risk of losing old growth stands in Alternative 4 through wildfire or insect infestation would be reduced because the areas around them would be treated.

Issue Indicators

For each alternative, the area of old-growth treated by MA in each 3rd order drainage was the evaluation criterion used to predict impacts on old growth habitat. Old growth stands are characterized based upon the following criteria:

- “ Average age of the old growth stand
- “ Number of trees greater than 21 inches DBH
- “ Number of snags/acre 9 inches DBH or greater
- “ Percent dead or broken top trees
- “ Number of canopy layers
- “ Minimum basal area

3.3.1.2 Regulatory Framework for Old Growth

Bitterroot National Forest Plan

The Forest-wide standard in the Forest Plan for old growth habitat states:

“The amount and distribution of old growth will be used to ensure sufficient habitat for the maintenance of viable populations of existing native and desirable non-native vertebrate species, including two indicator species, the pine marten and pileated woodpecker.”

The Forest Plan also provides standards for old growth maintenance in each Management Area. The Como Forest Health project proposes treatments in MAs 1, 2, 3a, and 3c. For

MA 1, old growth stands should be 40 acres or larger, distributed over the management area. Within each 3rd order drainage, 3% of the suitable timberland will be maintained in old growth. This standard is the same for MAs 2 and 3a, except 8% of the suitable timberland will be maintained in old growth. The standard for MA 3c is slightly different in that 8% of non-riparian suitable timberland in each separate piece of MA 3c within each 3rd order drainage will be maintained in old growth. The timber stand is the unit of delineation for old growth habitat. In practice, if a stand of old growth habitat is less than 40 acres, it is still managed as old growth.

3.3.1.3 Affected Environment of Old Growth Habitat

Green et al. (1992, errata 2005, p. 1) describes old growth forest types of the Forest Service Northern Region. This work was intended to provide local definitions of old growth to be used in the implementation of Forest Plans. The document states that, "Where there are conflicts with existing plan requirements, differences will be worked out on a case-by-case basis." Since the Bitterroot National Forest Plan "provides criteria to consider", there are no conflicts between Green's work and Forest Plan standards. The old growth habitat characteristics described by Green et al. (1992, errata 2005) for the types of old growth found in the project area are displayed in Table 3.3- 1. The habitat type groups used by Green, et al. (1992, errata 2005) are similar to those used in other habitat type grouping methods.

Table 3.3- 1: Western Montana Zone Old Growth Type Characteristics (Green et al. 1992, errata 2005)

DESCRIPTION		MINIMUM CRITERIA			ASSOCIATED CHARACTERISTICS				
OLD GROWTH TYPE ¹	HABITAT TYPE GROUP ²	AGE OF LARGE TREES	NUMBER OF LIVE TPA/DBH ³	LIVE BASAL AREA	DBH VARIATION ⁴	% DEAD/ BROKEN TOP	DOWNED WOODY MATERIAL ⁴	% DECAY	NUMBER OF CANOPY LAYERS ⁵
(#1) PP, DF, L, GF LP	A & B	170	8 ≥21"	60	M	12 3-23	L – M	5 0-11	SNGL
(#5) SAF, DF, GF, L, MAF, PP, WP, WSL	G, H	180	10 ≥17"	70/80	M	9 1-18	H	6 0-12	MLT

¹PP - ponderosa pine; DF – Douglas-fir; L – larch; GF – grand fir; LP – lodgepole pine; SAF – Engelmann spruce and subalpine fire; C – western red cedar, MAF – mountain hemlock, alpine larch, and subalpine fir; WP – western white pine; WSL – combinations of alpine larch, whitebark pine, and limber pine.

²See Green et al. (2005) for full description of habitat type characteristics

³TPA/DBH: trees per acre by diameter breast height; for example: in old growth type 1 there are a minimum of 8 trees per acre with DBH of 21 inches or greater.

⁴These are not minimum criteria. They are Low (L), Moderate (M), and High (H) probabilities of abundant large down woody material or variation in diameters based on stand condition expected to occur most frequently.

⁵This is not a minimum criterion. Number of canopy layers can vary within an old growth type with age, relative abundance of different species and successional stage. SNGL = single canopy layer, MLT = multiple canopy layers.

Individual old trees are a component of old growth habitat, but as individual trees do not constitute old growth habitat as defined in the Forest Plan or the scientific literature. For purposes of this analysis, as required by the Forest Plan, old growth habitat classification is based on stand-wide structure and characteristics. Old growth definitions are based on the presence of some minimum number of large, old, green trees in the stand. In old

growth classifications such as Green et al. (1992, errata 2005), the minimum number of large, old green trees required to meet the old growth definition varies by habitat type group. Tree mortality agents such as insects, disease, and fire can reduce the number of large, old green trees in a stand to the point that the stand no longer qualifies as old growth. These newly created large snags contribute to the old growth stand components, but do not continue to count towards the number of large, old, green trees that forms the basis of the old growth definition. Large snags are important to wildlife and the effects of this project on snags are discussed in the Snag heading. Mature trees, that are not in old growth habitat as defined here, are important to various wildlife species as well. The effects on mature stands, as they relate to impacts on specific wildlife species habitat, are discussed in those headings (See American Marten, Pileated Woodpecker, Black-backed Woodpecker, Flammulated Owl, and Fisher).

Wildlife species associated with old growth or mature forest habitats require the presence of habitat components such as large trees, snags, or down logs to provide them with food, cover and/or suitable nesting or denning sites. Animal species are adapted to survive the pattern of fire frequency, season, size, severity, and uniformity that characterized their habitat in pre-settlement times. When fire frequency increases or decreases substantially or fire severity changes from pre-settlement patterns, habitat quality for many animal species declines (Smith 2000).

Existing Condition

Old growth habitat in the Como Forest Health Project area is made up of ponderosa pine old growth forests and mixed conifer (mainly ponderosa pine, Douglas-fir, and grand fir) old growth forests. As listed by Green et al. (2005), they are considered Old Growth Types 1 and 5. These old growth stands are located in the western half of the project area in units 3, 4, 5, 6, 10, 45, 46, 47, E, and 75 (in Alternative 4 only) (Figure 3.3- 1). Old growth stands in the Como Forest Health project area were determined from stand exams done in 2013 (PF-WILD-030).

Old growth habitat within the project area has declined from what was historically present in pre-settlement times. There have been no large, stand-replacing fires within the project area since 1900, however heavy timber harvest conducted throughout the area selectively cut and removed large ponderosa pine and reduced the amount of old growth habitat at lower elevations.

Old growth habitat inventories indicate there are approximately 348 acres of old growth habitat in the third order drainages that are wholly or partially within the Como Forest Health project area. Currently, old growth distribution does not meet the applicable Forest Plan standards for old growth habitat in any of the third order drainages of the project area (Table 3.3- 2). Some of the 3rd order drainages include areas that are outside of the Como Forest Health project area.

Ponderosa pine old growth stands in the Como Forest Health project area have an increase in Douglas-fir competition, high stand density, and marked changes in forest structure. These old growth stands do not resemble historic stands due to their compositional differences, and are at risk from severe wildfire and insects. The threat of losing old growth to stand replacing fires and insects and disease is supported by recent history on the Bitterroot National Forest and other National Forests in Montana. In the fires of 2000 approximately 33,000 acres of old growth habitat was lost to stand-replacing

fires (PF-WILD-031). In the Middle East Fork area on the Sula Ranger District, 56% of the old growth habitat in the area was lost in a five-year period (2000 to 2005) due to the Douglas-fir bark beetle epidemic (USDA Forest Service 2005). The current mountain pine beetle epidemic has killed upwards of 90% of the lodgepole and ponderosa pines over extensive areas in western Montana since about 2005.

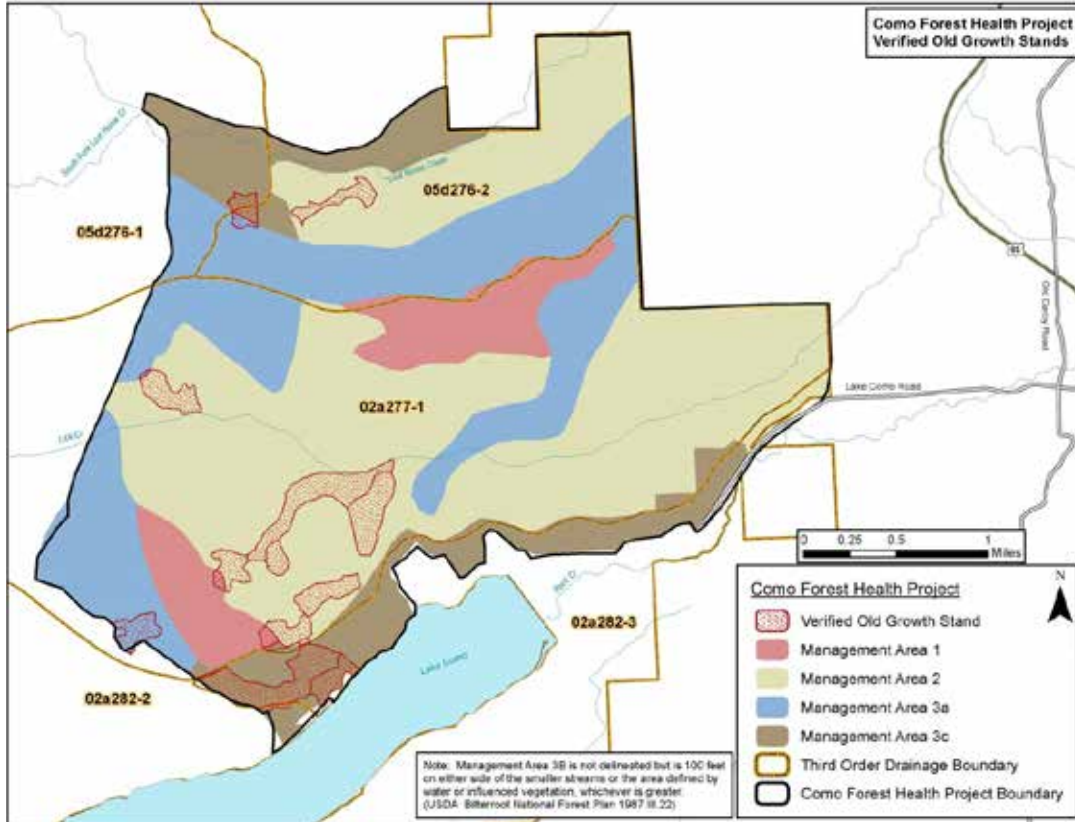


Figure 3.3- 1: Verified Old Growth Stands within Como Forest Health Project Area Shown by Management Area and Third Order Drainage

The existing amount of mixed conifer old growth is within its reference condition as it relates to density, structure, and species composition. However, the mixed conifer old growth stands older than 150 years show a decline from historic conditions in the project area (See Vegetation/Silviculture Report). The number of stands that are 101 to 150 years old has increased over time and has the potential to become replacement old growth.

Table 3.3- 3 shows the estimated amount of old growth habitat on the Bitterroot National Forest for all forested lands at the forest-wide scale and by MA on the forest-wide scale. According to Table 3.3- 1, there is adequate old growth across the BNF but the percentage of old growth varies across Management Area. In MA 1 and MA 3a across the forest, we meet FP standards, although we may be short on the low end of the confidence interval. According to Table 3.3- 3, the Bitterroot National Forest has inadequate old growth percentages in MA 2 across the Forest. These estimates are derived from Forest Inventory and Analysis (FIA) data (PF-WILD-018; PF-WILD-032). Czaplewski (2004) summarized use of FIA data to estimate old growth and snag densities, including assumptions and limitations.

Table 3.3- 2: Existing Percentage for Old Growth Habitat by Management Area and Drainage

3RD ORDER DRAINAGE BY MA	ACRES	ACRES OF OLD GROWTH BY MA		FOREST PLAN STANDARD COMPLIANCE IN CURRENT EXISTING CONDITION
		EXISTING CONDITION (ACRES)	EXISTING CONDITION (%)	
02a277-1	4595			
MA1	443	5	1.1%	Below Standard 3%
MA2	2245	195	8.6%	Total Meets Standard 8%, though one block is less than 40 acres
MA3a	1628	21	1.3%	Below Standard 8%
MA3c	87	3	3.4%	Below Standard 8%
02a282-3	1699			
MA1	0	-	-	-
MA2	158	0	0%	Below Standard 8%
MA3a	312	0	0%	Below Standard 8%
MA3c	1333	86	6.4%	Below Standard 8%
05d276-1	3800			
MA1	0	-	-	-
MA2	0	-	-	-
MA3a	133	0	0%	Below Standard 8%
MA3c	448	7	1.5%	Below Standard 8%
05d276-2	3390			
MA1	0	-	-	-
MA2	158	19	12%	Total Meets Standard 8%, though blocks are less than 40 acres
MA3a	312	4	1.3%	Below Standard 8%
MA3c	1333	5	0.4%	Below Standard 8%

Compared to the FIA data, old growth habitat within the Como Forest Health project area is below the Forest-wide estimate. While there appears to be adequate amounts of old growth across the Forest, the shortage of old growth within the Project Area is still important to recognize. The FIA data was collected in 2003. The data does not reflect changes caused by wildfire, beetle infestation, or harvest activities that may have occurred since then. Therefore, the habitat percentages in the FIA data are most likely an overestimation of what is currently on the landscape. The lack of old growth within the project area, particularly when there historically was old growth forest in the Como and Lost Horse Drainages (See Vegetation/Silviculture Report), indicates there has been a loss of habitat connectivity and diversity across the landscape which may limit the success of old growth dependent and associated wildlife species.

Table 3.3- 3: Estimate of Old Growth Habitat Percentages at Two Spatial Scales on the Bitterroot National Forest, Based on Analysis of FIA Data

ANALYSIS SCALE	PERCENT OLD GROWTH ESTIMATE	90% CONFIDENCE INTERVAL LOWER BOUND ¹	90% CONFIDENCE INTERVAL UPPER BOUND
Forest-wide – all Forested Lands	12.8	10.1	15.6
MA 1 Forest-wide	14.4	7.5	22.1
MA 2 Forest-wide	6.0	0.9	12.4
MA 3a Forest-wide	8.0	1.9	15.3

There are insufficient FIA plots in MA 3c to allow an estimate.

¹All confidence intervals are reported at the 90% level.

Desired Condition

The desired condition for old growth habitat within the Como Forest Health project area is to provide enough old growth habitat in the project area to support viable populations of old growth dependent and associated species as described previously in the regulatory framework.

3.3.1.4 Environmental Consequences

Methodology

For each alternative, the area of treated old growth by MA in each 3rd order drainage is the evaluation criterion used to predict impacts to old growth habitat.

Forest stands, which are homogenous areas of forest vegetation, generally five acres or larger, are the base unit for mapping old growth habitat on the Bitterroot National Forest. At the stand scale, old growth habitat in the Como Forest Health project area was identified based on vegetation data collected from Common Detailed Stand Exam plots were measured during 2009 and 2013 in all commercial treatment units. Data collected from these plots was then matched to the old growth definitions contained in Green et al. (1992, errata 2005) to determine which stands met the Regional old growth definitions.

Old growth habitat at the Forest and Geographic Area scales was analyzed by evaluating data collected at established FIA plots using the old growth definitions contained in Green et al. (1992, errata 2005).

Incomplete and Unavailable Information

Information concerning the condition of old growth stands outside of the project area is incomplete at this time.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined cumulative effects area for old growth is the four 3rd order drainages, which are entirely or partially inside the Como Forest Health project area. This analysis area is appropriate for analyzing incremental effects of the project actions in conjunction with past, present, and reasonably foreseeable actions because this is the scale defined by the forest plan. Additionally, management activities will neither create nor remove any old growth habitat outside of this boundary. An assessment of information available at the Forest level is also considered to provide additional context

Temporal Context

The only way to create old growth habitat is to grow a forest for longer than 170 years. Therefore, any reduction in old growth forest from the proposed activities in Alternatives 2, 3, and 4 would last for over a century, or until mature forests in the project area develop the old growth characteristics sufficient to replace any stands that may be removed.

Broader Context and Trends

Forest ecosystems throughout the Inland Northwest, including the Rocky Mountains, were created and maintained by frequent disturbance, principally fire (Hessburg and Agee 2003). Disturbance and resulting habitat fragmentation are natural parts of forest ecosystems in the project area, and native wildlife species are adapted to dynamic ecosystems. Timber harvest reduced the extent of mature and old forests at lower elevations throughout the Rocky Mountains (Arno et al. 1995, Lesica 1996), but fire suppression allowed more mature and old growth forests to develop at mid-to-upper elevations than was usual under historic fire regimes (Gallant et al. 2003). Fire suppression also allowed conifers to expand into many areas that had historically been maintained by fire as grass or shrub lands (Leiburg 1899, Gruell 1983, Habeck 1994, Gallant et al. 2003).

The amount of old growth habitat that existed in the project area or on the Forest prior to logging is not known. Green et al. (1992, 2005 errata, p.2) noted that in reviewing historic data it has been determined that the bulk of the pre-settlement upland old growth in the northern Rockies was in the lower elevation, ground-fire maintained ponderosa pine/western larch/Douglas-fir types. Lesica (1996, p. 37) estimated that old growth occupied 20 – 50% of the pre-settlement forest landscape in low and many mid-elevation habitats, and between 18 and 37% in mid to upper elevation habitats. Arno et al. (1995) state that old growth ponderosa pine was abundant in the accessible lower elevation valleys and mountain slopes in western Montana and has been logged heavily for more than 100 years. They suggest that less than 1 percent of the old growth seral ponderosa pine type in western Montana has no history of logging. Losensky (1995) estimated that historic old growth habitat in the Bitterroot – Blackfoot Climatic Area occupied about 67% of the ponderosa pine cover type, 24% of the pure Douglas-fir cover type, and 57% of the sub-alpine fir/grand fir cover types.

Logging in the Bitterroot Valley started in the late 1840s and continued through the 1870s (PF-WILD-033, PF-WILD-034). Early logging was mostly to produce logs and other wood products for use by local farmers and ranchers. This subsistence logging took the most accessible timber from the foothills and lower slopes of the Bitterroot Mountains. Once nearby timber was exhausted, the mills were dismantled and moved to a new location. In the 1880s through the early 1900s, the lumber industry in the Bitterroot area expanded from subsistence logging and milling for local use to providing mass quantities of timber and lumber for hard rock mines, railroads, and growing cities throughout Montana. Completion of the railroad to its terminus at Darby in 1889 allowed lumber companies to exploit timber on a large scale from the upper valley, along Tin Cup Creek and the West Fork of the Bitterroot River. The logging by the Anaconda Copper Company was extensive. In some areas “Nothing is left standing, for every tree over 6 inches in diameter is converted into lumber” (PF-WILD-033, PF-WILD-034). This historic logging dramatically reduced the amount of old growth in the Bitterroot drainage, particularly the ponderosa

pine in the lower elevations (PF-WILD-033, PF-WILD-034), and explains the lack of old growth in some 3rd order drainages today. Much of this early logging occurred within the Lick Creek drainage.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Timber harvest on Bitterroot National Forest in the Como Forest Health project area began with clearcuts, shelterwood cuts and seed tree harvests beginning in the 1800s and lasting into the 1990s. Many of these previous harvest units may have removed old growth habitat, but it is unknown whether forest stands within those units met old growth criteria at the time they were harvested. The extensive timber harvest in the area removed the majority of old growth habitat at lower elevations.

In areas of heavy fuel buildup created by fire suppression, a fire would be uncharacteristically severe in size and intensity. If this occurred, it could eliminate the few areas of old growth habitat that exist. Lesica (1996) concluded, "By reducing the occurrence of low intensity burns, fire suppression has increased the chance of stand-replacing fires in many remaining old growth stands."

Reasonably foreseeable activities are summarized in Appendix B.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

The No Action Alternative would not change existing old growth habitat percentages or conditions within any old growth habitat through management actions.

Alternative 1 also would not reduce the risk of a large, intense fire in the area because it would not reduce high fuel loads that are common in some areas. It would not increase the vigor of trees outside old growth stands because it would not reduce stocking densities in those stands. Trees outside old growth stands would remain at increased risk of mortality due to insects and disease, and those agents could subsequently attack trees in old growth stands. As stands continue to age, snag numbers would increase as a result of mortality due to insects and disease, and coarse woody debris would accumulate. In the longer term, increasing tree densities and fuel loads could increase the probability of a high-severity fire if an ignition occurred. A large fire burning through the area would likely result in a high degree of mortality in most of the existing old growth stands given existing and future fuel loads.

Cumulative Effects

The combination of increased fire risk and continued mortality from insects would result in an increased number of snags, but a potential decrease in old growth habitat. Old growth currently in the project area would remain as functional old growth until a disturbance occurred.

Alternatives 2 and 3

Direct and Indirect Effects

The effects of implementing these alternatives to some wildlife species associated with or dependent on old growth habitat is disclosed in those specific sections. Table 3.3- 4 indicates the area of old growth treated in each third order drainage in Alternatives 2 and 3.

Table 3.3- 4: Existing Percentage for Old Growth Habitat by Management Area and Drainage and Area Treated in Alternatives 2 and 3.

3RD ORDER DRAINAGE BY MA	ACRES	ACRES OF OLD GROWTH BY MA (% IN PARENTHESIS)		ACRES OF OLD GROWTH TREATED IN ALTERNATIVE 2	ACRES OF OLD GROWTH TREATED IN ALTERNATIVE 3
		EXISTING CONDITION (ACRES)	EXISTING CONDITION (%)		
02A277-1	4595				
MA1	443	5	1.1%	5 (0)	5 (0)
MA2	2245	195	8.7%	87 (4.8%)	50 (6.5%)
MA3a	1628	21	1.3%	21 (0)	21 (0)
MA3c	87	3	3.4%	2 (1.1%)	2 (1.1%)
02A282-3	1699				
MA1	0	-	-	-	-
MA2	158	0	0%	0	0
MA3a	312	0	0%	0	0
MA3c	1333	86	6.4%	50 (2.7%)	36 (3.7%)
05D276-1	3800				
MA1	0	-	-	-	-
MA2	0	-	-	-	-
MA3a	133	0	0%	0	0
MA3c	448	7	1.5%	0	0
05D276-2	3390				
MA1	0	-	-	-	-
MA2	158	19	12%	13 (3.8%)	13 (3.8%)
MA3a	312	4	1.3%	1 (1.0%)	1 (1.0%)
MA3c	1333	5	0.4%	1 (0.3%)	1 (0.3%)

Out of the 345 acres of old growth in the project area, 180 acres would be treated in Alternative 2 and 129 acres would be treated in Alternative 3. Assuming that treated units no longer qualify as old growth, none of the old growth areas remaining after implementation would be in contiguous blocks of 40 acres or more under Alternative 2 and only one block would remain in Alternative 3 (Figure 3.3-2 and Figure 3.3- 3); continuity between old growth areas would not exist.

Improvement cuts in ponderosa old growth would occur in units 3, 46, 47 and parts of 10 in Alternative 2 and in those same units, except Unit 46, in Alternative 3 (Figure 3.3-2 and

Figure 3.3- 3). These treatments would retain and perpetuate old growth characteristics in ponderosa pine. Group selection treatments in mixed conifer old growth would occur in units 4, 5, 6, 42, and 45 in Alternative 2 and 6, 42, and 45 in Alternative 3 (Figure 3.3-2 and Figure 3.3- 3). High severity prescribed burning would occur in mixed conifer old growth in unit E in both Alternatives 2 and 3.

Harvest treatments of old growth ponderosa pine can be successful when diameter caps and prescribed burning strategies are implemented that minimize ponderosa pine mortality (Vegetation/Silviculture Report). Studies have shown that ponderosa pine restoration is successful in late successional stands (Arno et al. 1995). However, prescribed burning in these units would be challenging because they have not experienced fire in over 100 years (Harrington and Sackett 1992). Although the units would be whole tree yarded and activity fuels would be in landing piles away from the large green trees, burning large duff accumulations at the base of trees may cause root damage and tree mortality (Vegetation/Silviculture Report, page 45). Current old growth ponderosa pine forests are very different from their pre-settlement counterparts that sustained frequent surface fire and a single entry to reduce fuel buildup could result in the loss of 20-50% of the old growth stand (Harrington and Sackett 1992).

The loss of 20-50% of the old growth within the treatment units would leave the remaining old growth stands across the project area in small isolated patches, which would be essentially nonfunctional for old growth dependent wildlife species. Connectivity between blocks of old growth would be fragmented; movement and dispersal of some wildlife species between the project area and the adjoining roadless and wilderness areas would be restricted.

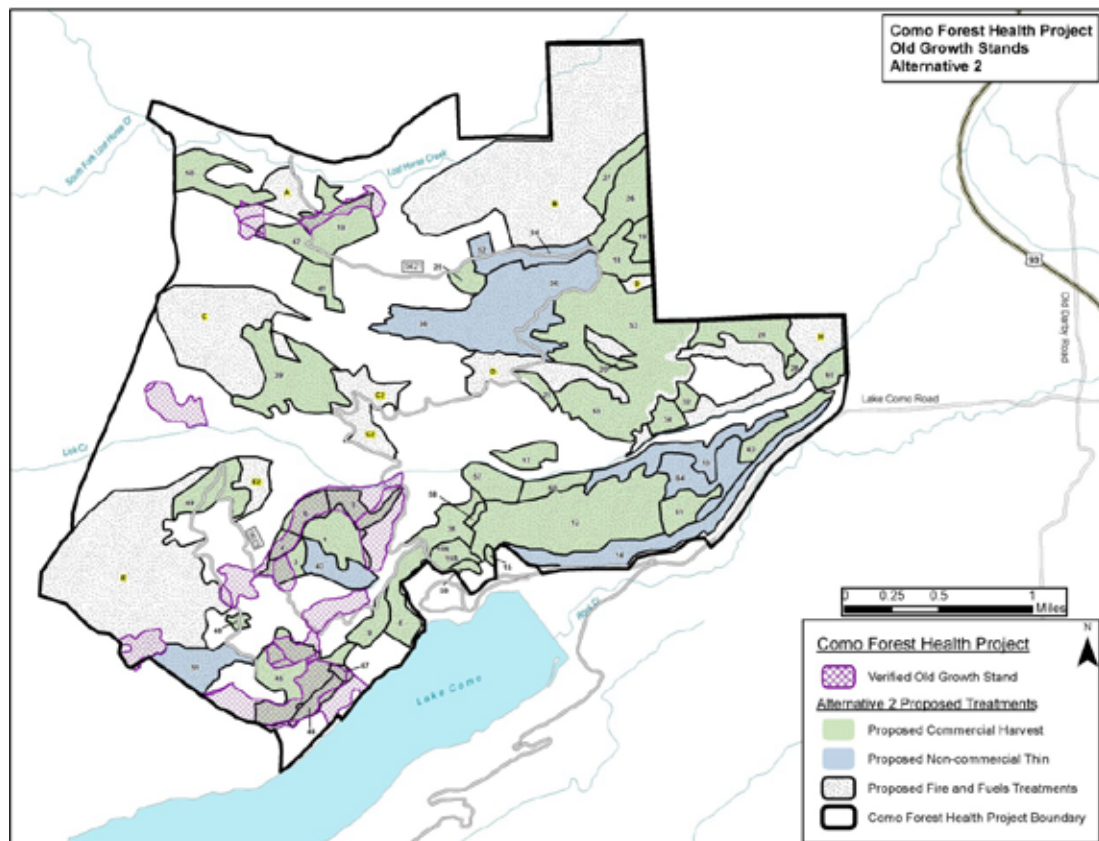


Figure 3.3- 2: Alternative 2 Treatments in Old Growth Stands

Treatment in mixed conifer old growth forest is complex and more uncertain that old growth characteristics could be maintained. Group selections would maintain large diameter, old trees that are important to meet old growth criteria (Green et al. 1992, errata 2005), but other essential old growth characteristics, such as snags, large woody debris, and structural variability, may change with treatment. Losing these characteristics would decrease the functionality of the old growth stands for the wildlife that utilize this habitat type. Prescribed burning would occur in these units following harvest without additional fuels reduction treatment in Alternative 2. This could reduce the characteristics of the stands below the levels that define old growth forests. Post-harvest reviews would occur before burning in Alternative 3, reducing the impact of the fire on the old growth components in the stands. The mixed conifer old growth forest stands in the Como Forest Health project area have dense vegetation and structural variability, which provide habitat connectivity for wildlife on an otherwise fairly open landscape. The loss of structural variability in these stands would negatively impact wildlife species such as fisher, marten, and pileated woodpeckers foraging and resting in these areas.

Unit E would be burned without any fuel reduction treatment. Due to the old growth components (low canopy base height and dense canopy closure) in this unit, the fire severity will most likely be high and remove this stand from old growth classification (Figure 3.2-3).

Alternatives 2 and 3 would reduce the risk of losing the existing old growth to a high severity wildfire, if one were ignited (Figure 3.2-5, Figure 3.2-8). However,

implementation of the prescribed treatments has the potential to reduce old growth forest characteristics, especially in the mixed conifer old growth forests.

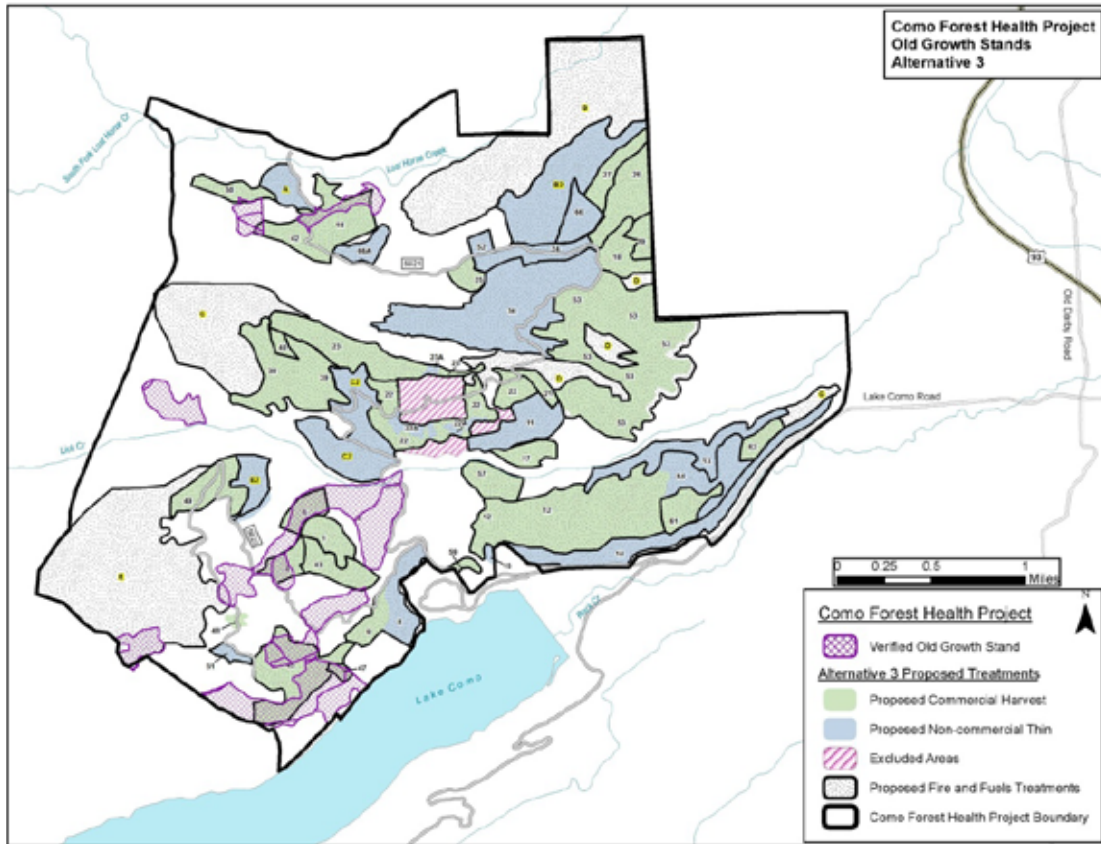


Figure 3.3- 3: Alternative 3 Treatments in Old Growth Stands

Cumulative Effects

Old growth treatments in Alternatives 2 and 3 will create a mosaic of openings and gaps in the forest canopy that would emulate natural disturbances. These openings can be beneficial for wildlife and provide structural diversity on the landscape when there is a homogenous stand structure across an area. However, in this project area, considering the loss of old-growth habitat from historic timber harvests, the presence of old growth provides that habitat diversity. The removal of such stands would decrease the mosaic of forest diversity, both locally and on a landscape scale.

Fires would continue to be suppressed in the Como Forest Health project area, and fuels would continue to accumulate, thereby increasing the potential for a high severity fire. Implementation of Alternatives 2, and 3 would reduce this risk, and potentially help maintain the ponderosa pine old growth stands if such a wildfire occurred.

Alternative 4

Direct and Indirect Effects

Alternative 4 would treat seven acres of old growth in aspen unit 75 (MA 3c, 05d276_1). The proposed treatment within the old growth portion of the unit would not alter the old growth characteristics of the stand and would maintain the old growth status. The rest of the old growth units in the project area would maintain their current old-growth status.

because they would not be treated. Aspen treatments would create snags by girdling the conifers, potentially enhancing the old growth characteristics of the stand. These snags would be different species, mostly aspen (*Populus* spp.) and spruce (*Picea* spp.), than snags present throughout the rest of the project area and would provide some diversity of wildlife habitat. Aspen snags are favored by cavity nesters, and spruce snags are extremely susceptible to rot, providing woodpecker foraging areas shortly after treatment. The amount of old growth treated in unit 75 would be all of the old growth in that unit, and in that portion of the 3rd order drainage within the project boundary. The aspen treatment would extend a connected block of aspen habitat that runs the entire length of the project area, creating a corridor for wildlife to travel and forage through.

Old growth ponderosa pine would still have a high risk of experiencing a high severity wildfire, should one occur in the project area. However, treatments in units surrounding the old growth units would reduce the risk of high severity wildfire within the old growth stands. This would be the same for mountain pine beetle infestation risk.

Old growth mixed conifer forests would retain all late successional characteristics including snags, large woody debris, and structural variability. These old growth units are well within their fire frequency intervals and are currently not at risk of insect or disease infestation.

Treating the units surrounding the old growth forest, as proposed in Alternative 4, would reduce the potential for mountain pine beetle infestation and provide more fire management options that could protect the old growth forests in the event of a fire. Thus, treating the area surrounding the old growth units would provide protection without the risk of reducing old-growth features or losing old-growth forests by treating them.

Cumulative Effects

Fires would continue to be suppressed in the Como Forest Health project area, and fuels would continue to accumulate, thereby increasing the potential for a high severity fire. Implementation of Alternative 4 would reduce this risk, and potentially help maintain old growth stands if a fire occurred.

3.3.1.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1 and 4 would be consistent with NFMA direction for diversity of plant and animal communities and ecological sustainability. Old growth would be retained and recruited through natural processes across the project area, thereby maintaining habitat necessary for several wildlife species.

Alternatives 2 and 3 would strive to be consistent with NFMA direction for diversity of plant and animal communities and ecological sustainability across the Forest. Although Alternatives 2 and 3 have the potential to reduce old growth within the Como Forest Health project area, treatments are intended to protect mature stands from stand-replacing fires, thus protecting them as potential future old growth habitat. The treatments are intended to help improve stand composition, improve the health and vigor of the remaining trees, increase growth rates, and reduce risk of losing the stands from

stand replacing fires, insects, and disease. The estimate of old growth across the Forest is generally on the low side of recommended levels (Table 3.3- 3).

Forest Plan

The Forest Plan states standards for maintaining old growth habitat by Management Area (MA) and third order drainage. The Plan specifies that patches of old growth habitat should be at least 40 acres and well distributed over the Management Areas.

Although the existing condition of the project area contains less old growth than directed by the Forest Plan, no old growth or very little old growth will be treated in Alternatives 1 and 4, respectively, and they will therefore meet the intent of the Bitterroot Forest Plan direction.

Alternatives 2 and 3 propose treating the old growth in order to protect the stands into the future. Silvicultural prescriptions would retain the essential characteristics necessary to meet the old growth criteria after treatment in ponderosa pine old growth stands. Mixed conifer stands would be treated with the same intention, but results are more uncertain. Treatment in the mixed conifer old growth units would likely not be consistent with Forest Plan direction.

3.3.1.6 Summary of Effects

The project area cannot meet the Forest Plan standards for old growth habitat distribution by MA in third order drainages until additional stands grow and mature to the point that they meet old growth criteria.

Implementation of Alternatives 1 and 4 would not reduce the amount or distribution of old growth from the existing condition, and they would have no direct impacts on old growth habitat. The old growth component cannot meet the Forest Plan Management Area standards for old growth habitat distribution by 3rd order drainage in the project area until additional stands grow and mature to meet old growth habitat criteria.

Alternative 1 could have a cumulative effect of reducing old growth habitat in the future because of the continuing risk of high severity fire.

Alternative 4 would retain existing old growth in the project area and would maintain recruitment stands to increase the amount of old growth in the project area in the future.

Implementation of Alternatives 2 and 3 have the potential to reduce old growth habitat in the project area. Alternatives 2 and 3 would potentially make some old growth stands and younger stands more resilient to insects, disease, and fire, but would risk losing the existing old growth or future old growth habitat as a result of these treatments, especially in mixed conifer old-growth.

3.3.2 Snags

This part of the wildlife analysis discusses the effects of implementing project alternatives on snags and snag habitat. The effects of implementing the project alternatives on species associated or dependent upon snag habitat occurs under the marten, pileated woodpecker, black-backed woodpecker, flammulated owl, and fisher headings.

3.3.2.1 Overview of Issues Addressed

Habitat Quantity and Quality

The scientific community has long recognized that snags, or standing dead trees, are an essential forest component that provide critical habitat for numerous wildlife species (McCelland 1977; Thomas et al. 1979). Many wildlife species depend on these dead trees for nesting, roosting, denning, foraging, resting, or shelter.

Snags are a dynamic resource; old snags fall and living trees die to become new snags. Snag-dependent wildlife need a continuous supply of snags over time. To provide a continuum of snag habitat, future snags must be planned for by leaving green trees to eventually become snags in managed stands. These recruitment snags should be representative of the species and size classes of the original snags in the unit. It is recognized that current conditions may not make it possible to meet this criteria. In that case, short-term efforts to retain all snags, even small ones or ones of a less desirable species, are preferred over not leaving any snags.

Snags are often removed during harvest and other management activities in order to provide safety for those working around them. The Occupational Safety and Health Administration (OSHA) has imposed standards that require the felling of danger trees (often defined as snags) that pose risks to woods workers (OSHA 29 CFR 1910.266). Additionally, the Forest Service Manual provides direction for publicly managed recreation opportunities, which includes removing trees identified as hazardous at developed recreation sites (FSM 2332.11). These safety standards can result in fewer snags than are necessary for certain wildlife species.

Issue Indicators

For each alternative, the number and type of snags that would be left after treatment was used to predict impacts to snag habitat. Snag retention standards were applied to each treatment unit. We reviewed the scientific literature applicable to snags in the Northern Rocky Mountains to determine an appropriate number of snags to retain for wildlife habitat per acre, categorized by Fire Group.

3.3.2.2 Regulatory Framework

Forest Plan

The Bitterroot Forest Plan states “All snags that do not present an unacceptable safety hazard will be retained.” (p. II-20) (USDA Forest Service 1987). The Forest Plan Five Year Review (PF-FPMON-002, p. 22, Appendix p. 70) clarifies that the purpose of the 1987 Forest Plan snag standard is to retain some vertical structure in the regenerated forest, in support of the wildlife goals and objectives, while providing a safe working environment. The Forest Plan Five Year Review (USDA Forest Service 1994, p. 22) also states that “In order to meet the intent of the Forest Plan to retain some large vertical woody structure, about two trees per acre are needed...” (Ibid). In old growth habitat, the Forest Plan (p. II-20) has as criteria to consider “snags, generally 1.5 per acre greater than 6 inches dbh and 0.5 per acre greater than 20 inches” (USDA Forest Service 1987).

3.3.2.3 Affected Environment

The scientific community has long recognized that snags, or standing dead trees, are an essential forest component that provide critical habitat for numerous wildlife species (McCelland 1977; Thomas et al. 1979). Several factors or combinations of factors can be

responsible for tree mortality, including insect outbreaks, diseases, fire, drought, and flooding. The events and decay processes that create these dead trees also maintain the snag resource through time. Snags occur on the landscape as individual trees, patches, or entire stands after disturbance processes move through the local ecosystem, and wildlife species in the Northern Rockies have evolved to utilize these structures. How a snag is used is dependent on how the tree died, its species, its size, and its longevity as a snag (Bull et al. 1997).

Many wildlife species depend on these dead trees for nesting, roosting, denning, foraging, resting, or shelter. Woodpeckers and nuthatches are primary cavity nesters, and have the ability to excavate cavities in snags where they nest and roost. Woodpeckers usually excavate a new nest cavity each year, leaving their old nest cavities available for many secondary cavity users. Secondary cavity users, which include many species of birds and mammals, cannot excavate a cavity but use existing ones for nesting, denning, or shelter. The space behind loose bark on snags also provides nest sites for brown creepers (*Certhia americana*) and roost sites for bats. Snags with broken tops often provide nest platforms for great gray (*Strix nebulosa*), great horned (*Bubo virginianus*), and barred (*S. varia*) owls. Snags are also used by some woodpeckers for foraging. Pileated woodpeckers (*Dryocopus pileatus*) forage extensively in the interior wood of snags in search of carpenter ants (*Camponotus* spp.). Hairy (*Picoides villosus*), black-backed (*P. arcticus*), and three-toed (*P. dorsalis*) woodpeckers all forage extensively on dead trees, particularly on insects in the bark, cambium, and sapwood (Bull et al. 1997).

A suitable wildlife tree is a dead, partially dead, or defective live tree at least 12 inches dbh and a minimum of 6 feet tall (USDA 1986). Large-diameter snags provide nest habitat for the greatest variety of cavity nesters and stand longer than smaller snags (Bull et al. 1997).

Snag longevity, or the amount of time a snag stands, varies depending on the tree species, size and diameter, forest type, soil type, moisture, and how the tree died. In general, ponderosa pine snags that died from fire or beetles will remain standing for 10 years or less (Bull et al. 1997), while ponderosa pine snags that were exposed to nonlethal fire while they were living may remain standing for up to 50 years (USDA 2000).

Snags killed by mountain pine beetles provide abundant foraging opportunities for many woodpecker species that feed on pine beetle larvae such as the three-toed woodpecker and the black-backed woodpecker. However, this prey base disappears from individual trees after a year when the larvae become adult beetles and exit the snag.

Existing Condition

Over the past century, timber harvest has occurred on approximately 3,880 acres of the project area, with the majority of the harvest occurring during the 1960s. There has been seed tree, group selection, sanitation, and shelterwood harvesting in units across the project area, leaving few snags in those areas. Snag levels have been managed in harvest units since 1987 in accordance with OSHA safety regulations.

The analysis area has not been affected by any large fires since 1975. Fire-hardened snags created by that fire may still be standing, providing wildlife shelter and denning habitat.

The Douglas-fir bark beetle epidemic that affected large areas on the southern half of the Forest in recent years has not been seen at high levels within the project area (See

Vegetation report). Aerial detection flights have shown new attacks from 2010 were limited, with most of the mortality being about 3 years old.

The major ecological process that has created snags across much of the Como Forest Health Project area is the ongoing mountain pine beetle outbreak. Aerial surveys done in 2013 to detect mountain pine beetle (MPB) attacks indicate that MPB are still very active near Lake Como and are killing approximately 4-5 TPA (trees per acre) and small groups of 5 to 40 trees in both lodgepole pine and ponderosa pine. The majority of these attacks in and near the project area have occurred within the past four years. In unit E, aerial surveys detect MPB are killing 5-10 TPA, and in unit 36, surveys detect that 3 TPA from MPB.

According to the 2012 Montana Forest Insect and Disease Conditions and Program Report, mountain pine beetle-caused tree mortality is at landscape epidemic levels throughout the West Fork, Bitterroot River, and Lake Como areas where numerous pockets of mortality (20-300 trees/group) were observed. Mountain pine beetle-caused mortality continued from previous years in ponderosa pines at moderate levels (typically 5-10 trees/group) (PF-WILD-012). Table 3.3- 5 summarizes the tree mortality from 2011 on the Darby Ranger District. This recent outbreak of mountain pine beetle has created hundreds of new snags across the Bitterroot National Forest. However, the increase in snags resulting from the beetle infestation is not occurring as extensively in the project area because safety regulations require the removal of hazardous trees in high use recreation areas.

Table 3.3- 5: Forest Mortality, Defoliation, and Other Damage on Darby Ranger District, 2011

DARBY RD	ACRES	TREES
Douglas-fir Beetle	2	2
Mountain Pine Beetle (PP)	17,376	11,913
Mountain Pine Beetle (LPP)	29,388	35,862
Subalpine Fir Mortality	4	3
MPB (High Elev. 5-needle pines)	224	77
Western Spruce Budworm	3,320	0

The number of snags present in the entire project area has not been systematically counted, however snags measuring over 9" dbh in potential old growth stands have been tallied. The Forest installed stand exam plots in many mature forest stands in the Como Forest Health project area in 2013. Stands with recent exams cover 3,116 acres of the 5,711-acre project area. Stands with stand exams were not selected randomly, but do represent a broad array of forest types and structural stages from across the project area. Therefore, the average snag numbers from these stands are probably representative of snag numbers in other stands in the project area.

Stand exams were completed in 78 different stands and the total and average number of snags per acre were calculated from the snag data. The total number of snags was 14,368 with an average of 4 snags per acre. **Twenty-six stands (33%) met the minimum recommended number of snags, 52 stands (66%) were below the recommended number of snags for each fire group, and 25 stands (32%) did not have any snags** (PF-WILD-015).

Trees that were still green when the stand exam plots were installed were not counted as snags, even if they had been attacked by bark beetles and were almost certain to die. Since the mountain pine beetle outbreak was still active in 2013 when many of the plots were installed, it is likely that the number of snags on the landscape is now higher than reflected in the data (PF-WILD-015). Snags less than 9" dbh were not counted since they are generally too small to provide nesting habitat for woodpecker species, although they can provide additional foraging opportunities. However, **even when including additional snags that have been created since the stand exams were installed and snags smaller than 9" dbh, snag numbers are lower than necessary to provide adequate habitat for snag-dependent wildlife species.**

Desired Condition

The desired condition for snag habitat within the Como Forest Health project area is to provide at least a minimum number of snags in the project area to support viable populations of snag dependent and associated species as described in the regulatory framework.

3.3.2.4 Environmental Consequences

Methodology

For each alternative, snag retention in treatment units was used to predict impacts on snag habitat. Snag retention standards were developed for each treatment unit. The project biologist reviewed the scientific literature applicable to snags in the Northern Rocky Mountains to determine an appropriate number of snags to retain for wildlife habitat per acre, categorized by Fire Group while still meeting the timber harvest objectives and safety regulations for the Como Forest Health Project (Table 3.3- 6).

This review included the Northern Region Protocol for Snag Management (USDA Forest Service 2000a), Abundance and Characteristics of Snags in Western Montana Forests (Harris 1999), Old-Growth Forest Types of the Northern Region (Green et al. 1992, errata 2005), and the Requirements for Snags and Downed Wood appendix from the Interior Columbia Basin Ecosystem Management Project FEIS (USDA Forest Service 2000b).

The first step in developing snag retention standards for an area is to recognize the natural distribution and density of snags on that landscape. Several different methods of classifying habitats and defining the number of snags expected to be in particular habitat types have been used. A Vegetation Response Unit (VRU) is an aggregation of land having similar biological capabilities and potentials for management with similar natural disturbance processes (USDA 1999). VRUs provide a basic environmental stratification for relating repeatable landscapes to predictable ecological processes (USDA 1999) and can provide a useful tool for predicting snag availability over time (USDA Forest Service 2000a). A full explanation of what defines a VRU can be found in the Vegetation and Silviculture report. Table 3.3- 6 shows the number or range of snags found in the various Vegetation Response Units (VRUs) and the minimum range proposed for this project

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined cumulative effects area for snags is the Como Forest Health project area. This project area is appropriate to analyze any incremental effects from the actions of this project on snags in conjunction with past, present, and reasonable foreseeable actions

because management activities will neither create nor remove any dead trees outside of this boundary. An assessment of information available at the Forest level is also considered to provide additional context.

Table 3.3- 6: Snags per Acre by Vegetation Response Unit as Cited in the Literature

LITERATURE	VEGETATION RESPONSE UNIT 1	VEGETATION RESPONSE UNIT 2	VEGETATION RESPONSE UNIT 3	VEGETATION RESPONSE UNIT 4	VEGETATION RESPONSE UNIT 7	VEGETATION RESPONSE UNIT 9
Equivalent to:	Habitat Type Group A Fire Groups 2, 4	Habitat Type Groups B & C Fire Group 6	Habitat Type Groups G & C Fire Group 11	Habitat Type Group D Fire Group 11	Habitat Type Group E Fire Group 9	Habitat Type Group H Fire Groups 5, 8
Harris	2.92	6.66	9.45	18.32	17.47	17.39
Green, et al.	0 to 22 (with an average of 6 > 9"dbh)	2 to 37 (with an average of 7 > 9"dbh)	0 to 92 (with an average of 19 > 9"dbh)	0 to 92 (with an average of 19 > 9"dbh)	2 to 43 (with an average of 15 > 9"dbh)	0 to 92 (with an average of 19 > 9"dbh)
ICBEMP FEIS Butte RAC Snags >21"	0.4 to 3.4	0.4 to 3.4	3.0 to 6.9	0.4 to 3.4	3.0 to 6.9	3.0 to 6.9
USDA 2000	1 to 2 (at least 20"dbh)	4 (at least 20"dbh)	6 to 12 (with 2-4 at least 20" dbh)	6 to 12 (with 2 at least 20" dbh)	Save all snags.	-
Como Forest Health Project Minimum Snag Requirements	2 to 5	4 to 12	10 to 15	10 to 15	10 to 15	10 to 15

Temporal Context

The effects of the reduction of snags in Alternatives 2, 3, and 4 would be in effect until other trees die. Given current mortality rates due to insects, disease, and fire across the Forest, it is likely that snag recruitment will continue and will eventually provide adequate snag numbers in the area within the next 10 years.

Broader Context and Trends

Snags are probably more abundant now on the Bitterroot National Forest than at any time. The fires of 2000 burned across approximately 307,000 acres of the BNF, creating millions of new snags. About 46 percent of this area burned with moderate or high severity where the majority of trees were killed and turned into snags. In the 54 percent of the area that burned with low severity, up to about 40 percent of the trees were killed as either individuals or small groups. The fires resulted in a large pulse of snags analogous to similar pulses created by large fires prior to active fire suppression. While the fires of 2000 may have been characteristic for some areas across the landscape, other areas across the landscape had higher levels of stand replacing fires (in warm dry habitat types) than would have been expected historically. This resulted in a higher mortality in large ponderosa pine – generally a fire resistant species – than is characteristic for that fire regime.

Wildland fires have burned 248,900 acres on the Bitterroot National Forest since 2003 (Table 3.3- 7), creating snag habitat across the Forest. Many of the fires were managed as natural fires because they burned in Wilderness or Roadless areas. Snags on a high percentage of these burned areas will never be harvested because they are in wilderness or roadless areas, or are otherwise difficult to access.

Table 3.3- 7: Acres Burned per Year since 2003, Creating Snag Habitat

YEAR	NATIONAL FOREST ACRES BURNED	YEAR	NATIONAL FOREST ACRES BURNED
2003	19,700	2009	2,200
2005	22,600	2010	1,300
2006	8,000	2011	18,000
2007	29,000	2012	100,000
2008	8,100	2013	40,000
SUBTOTAL	87,400	SUBTOTAL	161,500
		TOTAL	248,900

Additionally, the vast majority of snags created by these fires will be left on the landscape until they naturally fall and become downed woody material. The Forest only salvaged dead and dying trees from about 4% of the area burned in 2000, and from about 0.6% of the area burned in 2003. Most of the area that burned in 2005 was in Wilderness or Roadless areas, and was not salvaged. Approximately 235 acres of salvage logging has been completed within the non-wilderness portion of the 8,000 acre Gash Creek fire of 2006 (about 3% of the total area burned), but all snags will remain within the Wilderness. Within salvaged areas that burned during 2000, monitoring indicates that numbers of snags left following harvest averaged much higher than the number required under snag retention guidelines (PF-WILD-016; PF-WILD-017). Disturbance processes shape Bitterroot National Forest ecosystems because most of the snag habitat created by fires is not salvaged.

A second major source of current snags on the Bitterroot National Forest is the Douglas-fir bark beetle epidemic, which started before the fires of 2000. In 2002, Douglas-fir bark beetle populations soared to the highest infestation level ever recorded on the Bitterroot National Forest with approximately 29,000 acres infested on the southern half of the Forest. The epidemic continued through 2006 and has created large Douglas-fir snag habitat on over 30,000 acres of the Forest outside Wilderness, and about 20,000 acres in Wilderness. The Douglas-fir beetle epidemic appears to have tapered off, but aerial detection flights indicated that the number of acres impacted by this species increased five-fold from 2009 to 2011 (PF-WILD-012).

The ongoing mountain pine beetle epidemic has killed many thousands of lodgepole and ponderosa pine on the Bitterroot National Forest in the past few years. In 2010, mountain pine beetle activity increased exponentially across the Forest, affecting about 70,600 acres total (PF-WILD- 012). Mountain pine beetle was detected in many areas where it was not observed in 2009. The majority of trees killed by mountain pine beetle were on the southern half of the Forest.

Continual firewood cutting removes snags along open roads on the Forest. This reduces the number of potential nesting trees for cavity nesters as well as potential roosting and foraging habitat. Negligible cumulative impacts are expected because the abundance of

snags across the Forest and the small portion of the Forest available to firewood cutting. Management areas 1, 2, 3a, and 3c (the "roaded" portion of the Forest) comprise about 484,000 acres of the National Forest. About 334,600 acres (70%) of that area are more than 100 meters from a road, regardless of road status as open, closed or seasonally closed.

Estimates of snag numbers derived from Forest Inventory and Analysis (FIA) data show that snags are abundant and well distributed across the Forest. Table 3.3- 8 shows estimated average snag numbers per acre for forested lands within several different spatial scales across the Forest, based on estimates derived from FIA data (PF-WILD-018). Czaplewski (2004) summarized use of FIA data to estimate old growth and snag densities, including assumptions and limitations. The 10"+ class shows the average number of snags per acre that have a DBH of 10 inches or greater (Table 3.3- 8). Snags between 10" and 15" DBH are large enough for black-backed and three-toed woodpeckers to excavate nest cavities, and many (those 12"+) are large enough for all woodpecker species in our area except pileated woodpeckers to excavate nest cavities. Snags greater than 20" DBH are generally large enough for all species of woodpeckers to excavate nest cavities. Estimates of snag numbers are conservative, because they exclude data from plots where fire or harvest activities have occurred since the plots were last inventoried. These estimates also may not reflect the large number of snags created by insect outbreaks since the time they were last inventoried.

Table 3.3- 8: FIA Estimates of Snag Numbers on the Bitterroot National Forest

AREA	SNAGS 10"+			SNAGS 15"+			SNAGS 20"+		
	90% CI LOWER BOUND	ESTIMATE OF SNAGS/ACRE	90% CI UPPER BOUND	90% CI LOWER BOUND	ESTIMATE OF SNAGS/ACRE	90% CI UPPER BOUND	90% CI LOWER BOUND	ESTIMATE OF SNAGS/ACRE	90% CI UPPER BOUND
Entire BNF	7.9	10.0	12.3	2.3	3.1	4.0	0.6	0.9	1.3
MA 1	1.1	3.3	6.1	0.0	0.4	1.0	0.0	0.3	0.8
MA 2	0.4	2.4	5.1	0.2	1.5	3.1	0.1	1.3	2.9
MA 3a	2.3	7.2	13.9	0.3	2.0	4.5	0.1	0.7	1.4
MA 5	8.3	15.4	23.7	2.2	4.6	7.4	0.2	0.6	1.2
MA 5, 9	0.0	3.6	7.3	0.0	3.6	7.3	0.0	3.6	7.3
MA 6	8.6	24.4	43.3	3.4	13.4	24.8	0.4	3.7	7.3
MA 7	8.3	11.3	14.5	2.1	3.1	4.3	0.5	1.0	1.5

With the abundance of snags available now and snag management guidelines in place to assure a continuing supply, every indication is that snag numbers on the Forest will continue to meet the habitat needs of snag dependent wildlife species, which will have sufficient snag habitat to retain viability on the Forest. Therefore, the relatively minor effect of this proposal on snags is imperceptible and inconsequential when considered at the Forest scale.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. The effects of previous thinning and timber harvest within the project area have created the scarcity of quality snag habitat that is present in the area today. Over a century of timber harvest has reduced or eliminated snags from the project area.

Recent outbreaks of Douglas-fir beetle and mountain pine beetle have killed thousands of lodgepole pine and lesser numbers of Douglas-fir and ponderosa pine, creating a large pulse of snags in many stands throughout the project area. The mountain pine beetle outbreak is ongoing, and continues to create new snags. The trail system and developed recreation areas are areas where snags need to be removed to protect public safety. The effect of hazardous snag removal along trails and in recreation sites adjacent to the project area is minimal since only a small percentage of the project area coincides with the trail system or a recreation site.

There have been fairly recent fires close to the cumulative effects area that created thousands of acres of snag habitat. The Rockin' Fire in 2005 and the Rock Creek Fire in 1988 both occurred within 0.5 miles of the project boundary (See Fire and Fuels Report). The Rockin' Fire burned 5,933 acres and the Rock Creek Fire burned 11,937 acres. Most likely the majority of the snags created during those events have fallen or will fall in the next five years, however after a snag has fallen it can still be used for foraging and denning purposes on the ground. Neither of these burned areas were salvaged logged after the fire and are showing recent mountain pine beetle activity, which indicates snag recruitment will continue to occur directly outside of the cumulative effects area.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

In the short term, snag numbers would continue to increase as additional trees die from mountain pine beetle infestation and disease activity. At the same time, some existing snags would fall due to a combination of decay progression in their roots and stems, strong winds, and snow loads. Overall, the number and distribution of snags would probably continue to increase from the existing condition. In the long term, the existing dense canopies and high fuel loads common in the project area would continue to increase the risk of a large, intense fire that could kill most or all of the trees over a large portion of the project area. If such a fire occurred, it would dramatically increase the number of snags within the burned area. A large pulse of snags would provide abundant habitat for snag dependent wildlife species.

Cumulative Effects

Snags near open roads, along trails and around developed recreation areas would continue to be removed for safety and firewood purposes. These activities have the potential to reduce snag levels below thresholds along roads and recreation areas. However, snags that are located in stands that are away from roadsides and recreation areas would not be removed and would provide snag habitat at the required thresholds.

Alternatives 2, 3, and 4

Design Features and Mitigation Measures

Design features that retain snags and avoid harvest in the riparian areas are incorporated into the alternatives to ensure the provision of snag habitat (Chapter 2). Monitoring reports and field notes from previous projects done on the Bitterroot National Forest substantiate the effectiveness of these features (Forest Plan Monitoring Report 2008).

Direct and Indirect Effects

The effects of implementing Alternatives 2, 3, and 4 on snag-dependent or snag-associated wildlife species are disclosed in species-specific discussions that follow and are displayed in Table 3.3- 9. All snags would be retained on the untreated portions of the project area except for areas within 100 meters of open roads that are open to firewood cutting. Some snags would be felled and removed from commercial harvest areas. Treatments proposed for prescribed fire and non-commercial thinning would not cut or remove snags. The burning treatments would likely reduce the numbers of existing snags because some of them would catch fire and burn. Prescribed burning would also kill some green trees and create new snags, but the average size of new snags would likely be smaller than the existing snags that are lost. Prescribed fire in Unit E, in Alternatives 2 and 3, would most likely produce a large number of snags, as it is predicted to burn at high severity (Fire/Fuels Report, Figure 3.2-3). Snags that fall as a result of burning treatments would be left on site for coarse woody debris, continuing to provide structure and habitat for wildlife.

Old Growth stands, which have a higher density of snags and hollow trees, will be harvested in Alternatives 2 and 3, leading to a disproportionate amount of snags that could potentially be removed in those units for logging operations safety (Table 3.3- 9. More area of old growth forest would be treated under Alternative 2 than Alternative 3, and very little old-growth would be treated under Alternative 4. Aspen treatments would create snags by girdling trees and prescribed fire creeping through Units 73 and 74. These snags would be different species, mostly aspen (*Populus* spp.) and spruce (*Picea* spp.), than the snags that are present throughout the rest of the project area and would provide diversity in the benefits to wildlife species. Aspen snags are favored by cavity nesters, and spruce snags are extremely susceptible to rot, providing woodpecker foraging areas shortly after treatment.

Table 3.3- 9: Areas of Treatment with the Potential to Affect Snag Habitat

TREATMENT	ALTERNATIVE 2		ALTERNATIVE 3		ALTERNATIVE 4	
	ACRES	PERCENT OF PROJECT AREA	ACRES	PERCENT OF PROJECT AREA	ACRES	PERCENT OF PROJECT AREA
No treatment	2,383	42	2,553	45	3,601	63
Commercial harvest	1,478	26	1,295	23	1,117	20
Non-commercial harvest	531	9	929	16	770	13
Prescribed fire	1,319	23	934	16	202	4
Old-growth treated	187	3 (52 ¹)	143	2 (37 ¹)	7	< 1 (2 ¹)
Road and trail construction	6.3 miles	16 ²	0	0	2.4 miles	6 ²

¹percent of old-growth treated in the project area; Alternative 2 treats 52% of the old growth forest.

²percent maximum increase in roads. Temporary roads and tracked line-machine trails would be rehabilitated after timber harvest. The remaining National Forest system roads would be closed.

Snags might also be reduced along 6.3 or 2.4 miles of new system road, temporary road, and tracked line-machine trail in Alternatives 2 and 4, respectively, to provide for operations safety.

In Alternative 4, prescribed fire units A, B2, and C2 would be thinned before burning, reducing the severity of the prescribed fire and lessening the chances of losing snags during implementation. Unit E, where a high severity crown fire would most likely occur,

would not be treated and therefore new snag habitat would not be created. However, the snags that are currently within unit E would not be destroyed by the prescribed fire, negating the need for new snag creation.

Guidelines for snag and woody debris retention specified in Chapter 2 of the Environmental Impact Statement would be followed during harvest operations. These guidelines are designed to assure that the number, size, distribution, and species of snags that are left on site are within the historic ranges for a given habitat type, if such snags are currently available within the unit. Snags retained in the project area will be distributed in clusters throughout the unit. Larger snags would generally be favored for retention over smaller snags. All snags containing excavated cavities should be retained. Cavities indicate that the snag contains heart decay, and has little value for timber, but high value for wildlife. Monitoring of recent vegetation management activities on the Bitterroot National Forest indicates that snag retention guidelines have regularly been met or exceeded (PF-WILD-016; PF-WILD-017).

Cumulative Effects

The treatments in Alternatives 2, 3, and 4 would reduce the risk of large-scale stand replacing fire, which could delay creation of another large pulse of snags in the area like those seen historically. Fire suppression activities would continue in the project area, restricting the resurrection of the historic fire return interval and eliminating the chance any large pulses of fire-killed snags would be created in the area. Reasonably foreseeable activities are summarized in Appendix B. None of the ongoing or reasonably foreseeable activities will affect snags because snag management guidelines would require retention of an appropriate number of snags after the activity.

3.3.2.5 Compliance with NFMA and the Bitterroot National Forest Plan

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity of plant and animal communities and ecological sustainability across the Forest. Snags would be retained at levels appropriate for each Fire Group and would be recruited through natural processes across the project area. Snag habitat would be maintained for snag associated and snag-dependent wildlife species. Recent mountain pine beetle outbreaks and large wildfires within wilderness and roadless areas have created abundant snag habitat on the Forest and throughout the Region. Estimates from FIA data show that snags are abundant and well distributed across the Forest, and provide an ample amount of habitat for viable populations of snag associated wildlife species.

Bitterroot National Forest Plan

Alternative 1 would meet the direction from the Bitterroot Forest Plan because no snags would be removed from the project area.

The Forest Plan Record of Decision (p. 6) considered and permits salvage of dead or dying trees (PF-FPMON-002). The Forest Plan FEIS (Volume I, p. III-33, IV-22) specifically discussed the concern of stand replacing fires following mortality from insect epidemics and due to fire suppression (PF-FPMON-002). Salvage is also discussed in multiple areas of the Forest Plan and Record of Decision (PF-FPMON-002; PF-WILD-019), further supporting that the removal of snags, beyond what is necessary for safety, was not only intended but was programmed (FP p. II-20(6), II-20(2), II-22(2), III-8, III-14, III-21, III-29,

and III-35). Alternatives 2, 3, and 4 of the Como Forest Health Project are consistent with the Forest Plan because the snag retention guidelines described in Chapter 2 of the Como Forest Health EIS meet the intent of the Plan to provide vertical structure and maintain species viability while allowing salvage and fuel reduction activities.

3.3.2.6 Summary of Effects

Implementation of Alternative 1 would have no impact on snag habitat because existing snag numbers would be retained in the project area.

Implementation of Alternatives 2 and 3 would reduce the already low number of ponderosa pine, Douglas-fir, and lodgepole pine snags within many of the units through harvest, but would potentially create snags with prescribed fire and girdling trees. Proposed treatments would also leave the largest trees in the units as potential snag replacements.

Implementation of Alternative 4 would reduce the already low number of ponderosa pine and Douglas-fir snags within some of the units, but would retain old growth stands and abundant snag habitat for wildlife species associated with or dependent on snags across the project area. New aspen and spruce snags would be created in this alternative, and snag creation through ecological processes (wildfires, insect and disease infestations) would continue.

Threatened and Endangered Species

3.3.3 Canada Lynx (*Lynx canadensis*)

3.3.3.1 Overview of Issues Addressed

Habitat Quality and Quantity

Canada lynx inhabit conifer and conifer-hardwood habitats that support their primary prey, snowshoe hares. Disturbed areas, from timber harvest or natural processes (wildfire, insect infestations, and disease infections), that provide snowshoe hare forage and cover habitat provide lynx foraging habitat (Keith and Surrendi 1971; Fox 1978; Conroy et al. 1979; Wolff 1980; Parker et al. 1983; Litvaitis et al. 1985; Bailey et al. 1986; Monthey 1986; Koehler 1990, 1991; Agee 2000).

The United States Fish and Wildlife Service (USFWS) (2000) cited the inadequacy of existing regulatory mechanisms when it determined the threatened status of the contiguous U.S. distinct population segment. Lynx habitat has been lost due to management activities that eliminated habitat for lynx and snowshoe hares, such as extensive logging, suppression of forest fires and subsequent ecological succession, and habitat fragmentation from forestry, agriculture, and roads (NatureServe 2014).

The Bitterroot National Forest was recently designated secondary/peripheral lynx habitat, which most likely provides habitat for lynx during dispersal movements between populations or subpopulations. The relative importance of secondary or peripheral areas to the persistence of lynx in the contiguous United States is not clearly defined (USFWS 2005).

Within the Como Forest Health project area, there are 3.1 acres of lynx habitat located within unit E. The habitat located within the project boundaries is connected to a 1,150-

acre block of lynx habitat within the Blodgett-Lost Horse lynx analysis unit (LAU). This analysis focuses on the project effects on the 3.1 acres of Canada lynx habitat.

Issue Indicators

The area of Canada lynx habitat treated is the criterion used to predict Como Forest Health project effects on Canada lynx and their habitat.

3.3.3.2 Regulatory Framework

Canada lynx are currently listed as a threatened species under the Endangered Species Act. The regulatory framework providing direction for the protection and management of Canada lynx and their habitat for the Como Forest Health project comes from the National Forest Management Act of 1976, the Bitterroot National Forest Plan, and the Northern Rockies Lynx Management Direction.

Northern Rockies Lynx Management Direction

The Record of Decision (ROD) (USDA Forest Service 2007a) for the Northern Rockies Lynx Management Direction (NRLMD) FEIS (USDA Forest Service 2007b) was effective July 16, 2007. The ROD amended the management direction in the selected alternative into all Forest Plans in the planning area, including the Bitterroot National Forest Plan. The NRLMD FEIS management direction incorporates the Terms and Conditions the USFWS issued in their Biological Opinion and Incidental Take Statement (USFWS 2007). Direction in the NRLMD FEIS and ROD applies to mapped lynx habitat on National Forest presently occupied by lynx, as defined by the Amended Lynx Conservation Agreement between the Forest Service and USFWS (PF-WILD-035). However, all National Forests are encouraged to consider the direction in the NRLMD FEIS and ROD when designing management actions in unoccupied lynx habitat, such as on the BNF, but are not required to follow this direction (USDA Forest Service 2007a). This analysis documents the Bitterroot National Forest consideration of NRLMD direction.

3.3.3.3 Affected Environment

Existing Condition

Legal and Management Status

The USFWS lists Canada lynx as a Threatened species throughout the contiguous United States, and on July 2, 2013, the USFWS issued an updated species list to include Canada lynx as a Threatened species on the Bitterroot National Forest with a range description of "transient – secondary/peripheral lynx habitat" (PF-WILD-036). Up until the July 2013 version of the species list was published, the Bitterroot National Forest was considered to be "unoccupied" by Canada lynx.

The terms "occupied" and "unoccupied" lynx habitat are defined in the NRLMD Final Environmental Impact Statement (FEIS) (USDA Forest Service 2007b) which is the management direction for lynx habitat on National Forest System lands in the Northern Region. The NRLMD ROD amended the forest plans of 18 National Forests within the Rocky Mountain, Intermountain, and Northern Regions of the Forest Service, including the Bitterroot National Forest, to add specific objectives, standards, and guidelines described in the NRLMD for the management of lynx habitat. It utilized classifications of National Forest System lands as "occupied" or "unoccupied" by lynx, based on the Amended Lynx Conservation Agreement between the Forest Service and USFWS (USDA Forest Service and USDI Fish and Wildlife Service 2006). These definitions are as follows:

Mapped lynx habitat is considered **occupied** by lynx when:

- “ There are at least 2 verified lynx observations or records since 1999 on the National Forest unless they are verified to be transient individuals; or
- “ There is evidence of lynx reproduction on the National Forest.
- “ Areas of lynx habitat not meeting the definition of “occupied” are considered **unoccupied**.

The Bitterroot National Forest does not fit the definition of “occupied”, and is therefore considered “unoccupied”. The NRLMD ROD further states that in areas of unoccupied, mapped lynx habitat, the National Forest “should consider the management direction that is now incorporated into their Forest Plans when developing projects, but are not required to follow the management direction until such time as they are occupied by Canada lynx” (USDA Forest Service 2007b, page 29). Additionally, in 2009, the R1 Regional Forester issued a memo (PF-WILD-037) that directed Forests currently considered unoccupied, such as the Bitterroot National Forest, to “consider the management direction found in Attachment 1 of” the 2007 NRLMD ROD.

According to the recent updated species list from the USFWS, the Bitterroot National Forest is considered “secondary/peripheral lynx habitat.” The Canada Lynx Recovery Outline (USDI Fish and Wildlife Service 2005) classifies National Forest System lands further with respect to their status as core, secondary or peripheral lynx habitat. Definitions of these classifications are provided below:

- **Core areas** have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. Core areas are areas with the strongest long-term evidence of the persistence of lynx populations within the contiguous United States.
- **Secondary areas** are those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys to document the presence of lynx or reproduction. If future surveys document presence and reproduction in a secondary area, the area could be considered as core habitat. Secondary areas may contribute to lynx persistence by providing habitat that supports lynx during dispersal or other periods, and allows animals to return to “core areas.”
- **Peripheral areas** are those where the majority of historical lynx records are sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. They contain no evidence of long-term presence or reproduction that might indicate lynx colonization or areas of sustained use. However, some peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations.

Local Habitat Status

Potential lynx habitat does exist within the project area and there have been reported sightings of lynx in the vicinity of the project area in the past, but those observations remain unconfirmed. Hair snare surveys in 2013 did not detect lynx presence in the project area (PF-WILD-045). Lynx are known to be highly mobile and have a propensity to disperse long distances, particularly when prey becomes scarce (Mowat et al. 2000). Lynx also make long distance exploratory movements outside their home ranges (Aubry et al.

2000; Squires et al. 2001; Moen et al. 2004). For analysis purposes, the Forest Service recognizes that transient lynx may be present in the project area. For this reason, an evaluation of project effects on lynx habitat within the Como Forest Health project area is warranted as part of the NEPA process in anticipation of potential occupancy.

As defined in the Lynx Conservation Assessment and Strategy (LCAS), lynx habitat occurs in mesic coniferous forests that experience cold, snowy winters and provide a prey base of snowshoe hare (Ruediger et al. 2000). In the northern Rockies, lynx habitat generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine (*Pinus contorta*), subalpine fir (*Abies bifolia*), and Engelmann spruce (*Picea engelmannii*). Habitat may also consist of cool, moist Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), western larch (*Larix occidentalis*), and aspen (*Populus tremuloides*) when interspersed in subalpine forests. Dry forests do not provide lynx habitat. Lynx also require a forest with a mosaic of varying stand ages and structures to support abundant snowshoe hare populations. Lynx habitat on the Bitterroot National Forest is generally in areas that exceed 6,200 feet elevation and that support vegetation types dominated by subalpine fir or Engelmann spruce. The elevation of most of the Como Forest Health project area is too low to be considered lynx habitat.

Following the development of the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000), the Forest Service created maps delineating lynx habitat across National Forest System lands and defined Lynx Analysis Units (LAU) for use in analyzing project effects. The LAU is a project analysis unit upon which direct, indirect, and cumulative effects analyses are performed. LAUs are areas delineated across a landscape with sufficient lynx habitat, based on a conceptual framework meant to approximate the size of an adult female lynx home range. The Bitterroot National Forest contains 28 LAUs, encompassing all mapped potential lynx habitat. The Como Forest Health Project is within the Blodgett-Lost Horse, Rock-Ward, and Private Lands LAUs. However, only the Blodgett-Lost Horse LAU contains mapped lynx habitat that overlaps with a proposed treatment unit (Figure 3.3- 4).

Unit E is the only proposed treatment unit within mapped lynx habitat. All of the lynx habitat within the Blodgett-Lost Horse LAU is on National Forest and categorized using NRLMD ROD definitions (Table 3.3- 10). In total, there are 3.2 acres of mapped lynx habitat in the project area though much of the project area is multistoried habitat type (Table 3.3- 11).

Horizontal cover board surveys to detect and measure multi-storied mature or late successional snowshoe hare habitat were conducted where mapped lynx habitat overlapped Unit E during the summer of 2013 (PF-WILD-038 and PF-WILD-039).

In summary, 4 of the 6 randomly picked survey points within the stand contained mature, multi-storied or late successional snowshoe hare habitat. Snowshoe hare pellets were found at every survey point, indicating habitat is suitable for snowshoe hare, and in turn, Canada lynx. Formal surveys were done only in the area where proposed activities overlapped mapped habitat; however, the project biologist noted that a majority of the stands surrounding the mapped habitat looked similar to the surveyed stand. Walk-through assessments were made in areas surrounding the mapped habitat. There was no visible difference between mapped habitat and the surrounding area, indicating that the coarse-filtered map may have missed some areas of lynx habitat. Figure 3.3- 5 and Figure

3.3-7 show a wide perspective, looking into Unit E. Arrows point to the unit where horizontal cover board surveys occurred.

Table 3.3- 10: Existing Lynx Habitat in Blodgett-Lost Horse LAU

AREA AND CHARACTERISTICS OF LYNX HABITAT	AREA (ACRES)
Total LAU area	111,508
Total area of lynx habitat within LAU (outside of wilderness)	12,580
Stand phase: Multistory (provides snowshoe hare habitat)	5,454
Stand phase: Stem exclusion	5,542
Stand phase: Stand Initiation (provides snowshoe hare habitat)	233
Other habitat	1,361

Table 3.3- 11: Lynx Habitat within the Como Forest Health Project Boundary

AREA AND CHARACTERISTICS OF LYNX HABITAT	AREA (ACRES)
Total Como Forest Health Project Area	5,711
Stand phase: Multistory (provides snowshoe hare habitat)	3,687
Stand phase: Stem exclusion	1,321
Stand phase: Stand Initiation (provides snowshoe hare habitat)	407
Other	296
Total Lynx Habitat within Project Area	3

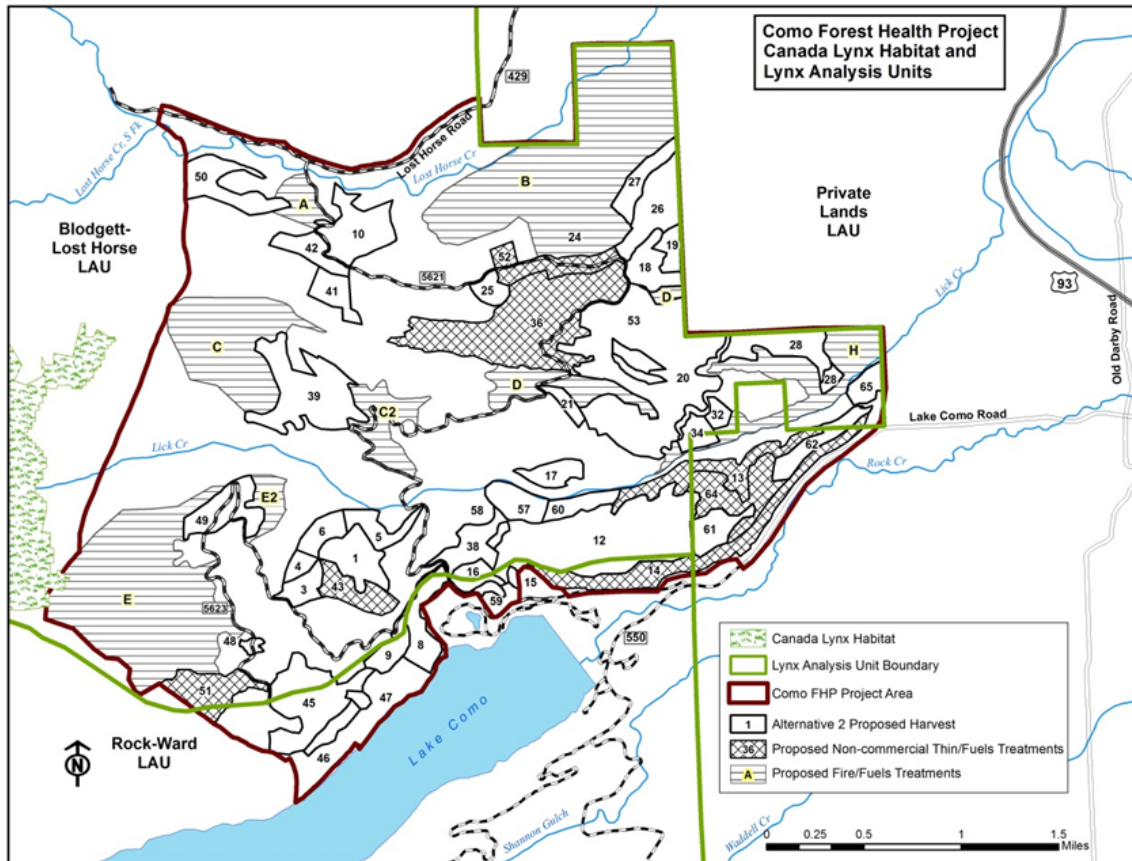


Figure 3.3- 4: Map of Canada Lynx Habitat and Lynx Analysis Units in Relation to the Como Forest Health Project Area.



Figure 3.3- 5: Photo Looking to the Northwest into Unit E from Ridge. Note the dense forest, interspersed openings



Figure 3.3- 7: Photo Looking to the North into Unit E from Ridge.



Figure 3.3- 6: Photo from horizontal cover board survey. Plot: CFHP01, Unit E. Note the dense forest and high fuel loads



Figure 3.3- 8: Photo from horizontal cover board survey. Plot: CFHP05, Unit E. Note the low canopy base height, recent mortality, and high fuel loads



Figure 3.3- 9: Photo from Horizontal Cover Board Survey. Plot: CFHP06, Unit E. Note the dense forest, high fuel loads, and low canopy base height.

Figures 3.3-6, 3.3-8 and 3.3-9 show the interior of Unit E, taken at 3 of the 6 survey points. Unit E is dense forest with low canopy base heights, continuous fuel and high levels of downed woody debris. Openings are interspersed through the area where trees or groups of trees have died and fallen. The openings provide areas for forest regeneration and snowshoe hare browse. The closed canopy areas with high levels of down, woody debris create hiding cover and subnivean habitat.

Local Population Status

Bitterroot National Forest lynx monitoring efforts using lynx hair snare methodology in 1999, 2001, 2002-3 (PF-FPMON-038), and 2010 (PF-WILD-042) have not detected the presence of lynx in a potential lynx linkage zone east of Lost Trail Pass identified in the NRLMD ROD (USDA Forest Service 2007a). However, older trapping records and unconfirmed sightings indicate that lynx have been at least transient visitors to the Bitterroot National Forest. Forest personnel identified a set of lynx tracks in the upper Larry Creek drainage in 2004 during a marten monitoring transect. A hunter reported seeing a lynx in the upper Lick Creek drainage in 2002. MTFWP personnel sometimes find lynx tracks on or near the Forest while conducting their furbearer track surveys. None of these records are considered to be confirmed evidence of lynx presence because of the possibility of misidentification. MTFWP trapping records indicate that three lynx were harvested from MTFWP District 2 (which consists of Ravalli, Missoula, Powell, Mineral and Granite Counties) in 1998 (PF-WILD-004), and that one lynx was taken during the 1986 trapping season in Hunting District 270 (which is made up of the East Fork Bitterroot) (PF-WILD-043).

MTFWP closed the lynx trapping season throughout Montana when lynx were listed as a Threatened species. Currently there is no legal lynx trapping in Montana, although lynx may occasionally be caught in traps targeting other species. MTFWP has no records of lynx trapped in Ravalli County since 1986 (PF-WILD-004; PF-WILD-043).

Threats and Limiting Factors

The USFWS (2000) cited the inadequacy of existing regulatory mechanisms when they determined the status of the contiguous United States distinct population segment of Canada lynx as threatened. "Current U.S. Forest Service Land and Resource Management Plans include programs, practices, and activities within the authority and jurisdiction of federal land management agencies that may threaten lynx or lynx habitat. The lack of protection for lynx in these plans render[s] them inadequate to protect the species" (USFWS 2000).

Forest fire suppression and extensive logging eliminated habitat for lynx and snowshoe hare. These previous practices promoted ecological succession to habitats that no longer support snowshoe hare and lynx. Habitat fragmentation and isolation of suitable habitats, from forestry, agriculture, and roads interrupts dispersal patterns and increases the potential for mortality of individuals. Isolation of Canada lynx populations can reduce genetic fitness and lead to population declines in some regions. While this is not the case on the Bitterroot NF, The Forest has been identified as an area with good connectivity probability and as a lynx linkage zone between the Frank Church River of No Return Wilderness and the Lolo National Forest (PF-WILD-040, PF-WILD-041). Therefore, changes to the habitat on the Bitterroot NF, which may prohibit lynx from using the area as a linkage zone, may lead to reduced gene flow between lynx in northwestern Montana and southern populations.

Past excessive trapping of lynx, as recently as the 1970s and 1980s, depressed populations and may have caused the decline of local lynx populations in Washington (U.S. Forest Service et al. 1993) and elsewhere, including Montana (U.S. Fish and Wildlife Service 1998).

Road construction causes habitat fragmentation and allows increased human access into lynx habitat. This may increase lynx mortality by facilitating hunter and trapper access. Though lynx hunting or trapping is not legal, incidental harvest of lynx may occur in the course of legal hunting and trapping for other species. Increased winter recreation (snowmobiles, ski area development) may cause displacement and/or incidental lynx mortality. Habitat changes and increased access into lynx habitats has increased competition and displacement of lynx by bobcat and coyote.

Desired Condition

The desired condition for Canada lynx within the Como Forest Health project area is to not contribute to the decline in lynx habitat or habitat quality and to not jeopardize the continued existence of the Canada lynx population.

3.3.3.4 Environmental Consequences

Methodology

For each alternative, the area of treated Canada lynx habitat was the criterion used to predict impacts on Canada lynx and their habitat.

Lynx habitat has been mapped using Satellite Imagery Land Classification with lynx analysis units delineated based on criteria from Ruediger et al. (2000). Within the Blodgett-Lost Horse LAU, lynx habitat was analyzed using Geographic Information Systems (GIS) software, based on vegetation information recorded in the Timber Stand Management and Record System (TSMRS) database. Vegetation information used included the species composition and structural stage of the analyzed stands. Impacts were measured by changes in stand structure within mapped habitat from proposed activities. Analysis of lynx habitat and potential impacts were made using ArcGIS and Microsoft Excel software.

All treatment units within mapped lynx habitat were field surveyed using the methodology of Squires and DeCesare (2008) (PF-WILD-038). The surveys use a horizontal cover board to determine the presence of mature, multi-storied stands that provide winter snowshoe hare habitat.

Unit E is the only proposed treatment unit within mapped lynx habitat. Direct, indirect and cumulative effects on Canada lynx and their habitat for all alternatives were only analyzed for Unit E.

Incomplete and Unavailable Information

The population size of Canada lynx within the Bitterroot Mountains is unknown at this time. Habitat types (as defined by the NRLMD) for stands within the Selway-Bitterroot Wilderness boundary are incomplete for the Blodgett-Lost Horse LAU. Total area of habitat types was determined only in the non-wilderness areas.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for Canada lynx is the Blodgett-Lost Horse LAU (111,508 acres). This LAU is the appropriate size on which to analyze cumulative effects on Canada lynx and their habitat because the LAU is the approximate size of a female's home range and contains year-round habitat components. The Lynx Conservation and Assessment Strategy (Ruediger et al. 2000) stated that at least 6,400 acres of primary vegetation (lynx habitat) should be present within each LAU to support lynx survival and reproduction. Since the amount of lynx habitat in the Blodgett-Lost Horse LAU is more than triple the amount thought necessary to support lynx survival and reproduction, the cumulative effects area for lynx is the LAU boundary. This area is appropriate to assess effects on lynx because the project would affect a small amount of lynx habitat, and incremental effects of proposed activities of this project on lynx populations outside the cumulative effects area would not be measurable. LAUs were created to facilitate analysis and monitoring of the effects of management actions on lynx habitat. The State level consideration is used to provide a broader context for the more localized effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would continue as long as the treated stands considered lynx habitat remained in an unsuitable condition for lynx. This could last from 10 to 30 years, until the stand regenerated.

Trends and Broader Context

MTFWP classifies lynx as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the lynx as a G5 S3 species (MTFWP 2014). This means that at the global scale, lynx are considered common, widespread, and abundant (although they may be rare in parts of their range). They are apparently not vulnerable in most of their range. At the state scale, they are considered to be potentially at risk because of limited and potentially declining numbers, extent, and/or habitat, even though they may be abundant in some areas.

In the contiguous United States, the overall lynx numbers and range are substantially reduced from historical levels (NatureServe 2014). At present, numbers have not recovered from overexploitation by both regulated and unregulated harvest that occurred in the 1970s and 1980s. Forest management practices that reduce the age structure diversity, fragment the forest and extend fire return intervals alter suitable lynx habitat. As a result, many states may have insufficient habitat quality and/or quantity to sustain lynx or their prey (NatureServe 2014).

McKelvey et al. (2000) looked at the historical distribution of lynx from the 1880s to the present. In Montana, they found evidence of lynx from museum specimens collected between 1887 and 1921 (three from the Bitterroot Mountains), and reliable trapping data obtained from MTFWP beginning in 1950. These data show continuous presence of lynx in Montana since that time, based on over 475 lynx harvested by trappers. Lynx harvest data from Montana is cyclic with peaks corresponding closely in time and magnitude with those occurring in western Canada, especially in 1963 and 1971.

This implies that lynx populations in Montana may be at least partially sustained by animals dispersing from Canada during peak years (Ibid).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Prior to timber harvest, lynx habitat in the Blodgett-Lost Horse LAU was maintained by fire. Timber stand regeneration harvest above 3,500 feet elevation reduced denning habitat but 10-30 years later when these stands regenerated, they became lynx foraging habitat by providing habitat for snowshoe hares. Non-commercial thinning temporarily set back the foraging habitat but expedited its transition to denning habitat.

Successful fire suppression may have allowed many forested stands in the cumulative effects area to mature and become better lynx denning habitat than they might have under the influence of the historic fire regime. The historic fire regime would typically produce a mosaic of burned and unburned areas over time. The historic mosaic would have likely provided a juxtaposition of denning and foraging habitat that would have been beneficial to lynx.

Alternatives 1 and 4

Direct Effects

There are no direct effects of choosing Alternative 1, the No Action alternative, or Alternative 4 because lynx habitat would not be treated in either alternative.

Indirect Effects

In the short term, lynx denning habitat quality may improve as conifer seedlings continue to grow above the snow layer. Dead and dying lodgepole pine fall and create accumulations of downed logs that lynx use as secure den sites. Lynx foraging habitat may also improve as lodgepole pine mortality opens up overstory canopies and allows conifer seedlings and shrubs to become established in the understory. This would improve habitat for snowshoe hares, the primary prey species for lynx. In the longer term, increasing fuel loadings as trees attacked by pine beetles die and fall would increase the probability of a large, intense fire if an ignition should occur. A large fire that burns with moderate or high intensities would make lynx habitat unsuitable until conifer seedlings establish and grow tall enough to protrude above the snow layer.

Cumulative Effects

Lynx habitat in the project area would be functional until a disturbance occurred. The other treatments outside of mapped lynx habitat proposed in Alternative 4 would not have any direct or indirect effects in lynx habitat and would therefore, have no cumulative effects on the retention or loss of lynx habitat.

Alternatives 2 and 3

Direct and Indirect Effects

Alternatives 2 and 3 propose moderate to high severity fire in Unit E, which overlays all of the mapped lynx habitat (3 acres) within the project area.

Canada lynx require a landscape containing early (DeVos and Matel 1952, Heinselman 1973, Koelher 1990, Koelher and Brittell 1990, Poole et al. 1996) and late-successional (Koelher and Brittell 1990) habitats and may be positively or negatively affected by fire (Kelleyhouse 1979, Poole et al. 1996, Quinn and Parker 1987, Wright and Heinselman 1973). In general, wildlife species that are associated with early successional vegetation may benefit from fuel reduction treatments. Species associated with late-successional habitat with features such as a closed canopy, a dense understory, and coarse woody debris may be negatively affected by fuel reduction treatments. Canada lynx require both, so the effects of fuel reduction on Canada lynx may vary with the management history

of an area, current habitat condition, landscape setting, and prescribed fire attributes such as size, type, frequency, and season.

Table 3.3- 12 shows the response of Canada lynx following timber harvest and fire. Fires that create a mosaic of successional stages are most beneficial for providing foraging and denning areas for Canada lynx (Allen 1987, Fox 1978, Koelher and Brittell 1990, Parker et al. 1983, Poole et al. 1996, Quinn and Parker 1987, Wright and Heinzelman 1973).

Table 3.3- 12: Response of Canada lynx Following Timber Harvest and Fire in the North American Boreal Forest (Ulev 2007)

SUCCESIONAL STAGE	CANADA LYNX RESPONSE
<u>Initiation stage</u> : 0 to 10 years; trees and canopy cover absent; downed woody material abundant in burns (variable based on severity) and variable in clearcuts	limited data; Canada lynx may use both burned and logged stands
<u>Establishment stage</u> : 11 to 25 years; shrubby and herbaceous vegetation increase; grasses decrease	variable; abundant Canada lynx due to abundant snowshoe hares
<u>Aggradation stage</u> : 26 to 75 years; tree density and canopy cover increase; shrubby and herbaceous vegetation decrease	differing data; abundant Canada lynx due to abundant snowshoe hares
<u>Old-growth stage</u> : 76 to 125+ years; heterogeneous canopy and stand structure; downed woody material; large trees and snags; developed understory	minimal data; Canada lynx not abundant

Due to their dependence on snowshoe hares, management practices that benefit snowshoe hares will benefit Canada lynx (Parker et al. 1983); and fire is an important disturbance for maintaining high-quality habitat for both species (Grange 1965, Poole et al. 1996). Snowshoe hares are associated with disturbed and subclimax communities adjacent to dense cover (Giusti et al. 1992, Koelher 1990, Poole et al. 1996, Wolff 1980), which are created after burns or clearcut harvests (Poole et al. 1996). Optimum habitat for snowshoe hares is 15- to 40-year old, second-growth stands containing a dense, brushy understory and a high density of saplings (Koelher 1990, Koehler and Aubry 1994, Wolff 1980). Ideally, for lynx, these habitats should be adjacent to mature forests containing coarse woody debris for denning and raising kittens (Allen 1987, Brown 2002, Bull et al. 2001, DeGraaf and Shigo 1983, Gilbert and Pierce 2005, Koelher 1990, Koelher and Brittell 1990, Parker et al. 1983, Wisdom et al. 2000).

The proposed burn in Unit E may have negative impacts on Canada lynx and snowshoe hares in the short-term due to reduced food and cover (Koelher and Brittell 1990, Parker et al. 1983). This burn would consume existing downed wood, remove horizontal cover present in the unit, and create large openings in the canopy. The burn would eliminate habitat that is currently being used by snowshoe hares. As succession progresses, the amount of browse may increase, and snowshoe hares in the unit may become more abundant (Wright and Heinzelman 1973). This treatment, therefore, would convert this area of lynx habitat to unsuitable condition until conifer regeneration grows tall enough to protrude above the snow layer, which may take 10 to 30 years.

Because the Bitterroot National Forest is considered "secondary or peripheral lynx habitat" used by transient lynx (PF-WILD-036), traveling habitat and cover is likely to be more important than denning habitat to lynx in the area. Canada lynx tend to avoid open areas when traveling (Koelher 1990, Koelher and Brittell 1990, Oliver et al. 1994, Oliver et al. 1998). Favored travel routes for the Canada lynx include ridges and saddles, and cover should be maintained in these areas (Koelher 1990). Koehler (1990) recommends a tree density of >180 stems/acre and a tree height >6.0 feet (1.8 m), especially where snow depth is >2.0 to 3.0 feet (0.6-0.9 m). Midsuccessional stages may provide

travel cover and connectivity within a forested landscape for Canada lynx (Koehler and Aubry 1994). In western portions of Canada lynx habitat, maintaining travel corridors between populations may help ensure long-term viability of isolated populations (Koehler 1990, Koehler and Brittell 1990).

The proposed burn in Unit E would reduce tree density below 180 stems/acre and create large openings in the canopy. The large openings would allow more snow to accumulate and make travel for lynx more difficult. The burn has the potential to create a 2-mile gap on the ridge between areas of travel cover. The size of this gap would reduce habitat connectivity, decreasing the ability of transient lynx to successfully move across the Bitterroot Mountains between areas of core habitat in Northern Montana and the southern Rockies.

Alternatives 2 and 3 would require over 2 miles of a 20-foot wide fuel break to be created along the western and northern boundary of Unit E in order to contain the proposed burn within the unit. This fuel break would cut through stands of mature and stem exclusion stage forest. Habitat fragmentation and snow compaction along this fuel break would occur, facilitating the movements of lynx competitors, such as coyotes, wolves, and bobcats.

Cumulative Effects

The impacts of management activities proposed in Alternatives 2 and 3 are analyzed under the Direct and Indirect Effects, and are expected to have some minor negative impacts to the quality and distribution of lynx habitat in the short term. These treatments would generally improve habitat quality in the longer term. Canada lynx may not be affected by fuel reduction on the stand level due to their large home ranges (Pilliod et al. 2006). However, the effects of removing the mature, multistoried forest in Unit E are amplified when previous disturbances in adjacent stands are considered. Wildfires from the 1980s and 1970s surround the project area with regenerating forest between 30 – 40 years old. These areas of early successional forest adjacent to the mature forest in Unit E provide the mosaic of structures that contribute to quality lynx habitat.

3.3.3.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Endangered Species Act of 1973 (as amended)

The USFWS specifies that the lack of guidance for conservation of lynx and snowshoe hare habitat in National Forest Land and Resource Plans was the primary factor causing lynx to be listed. Recommendations in the Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) were considered during the analysis of the Como Forest Health Project. Alternative 2 maintains a mosaic of forest structures and successional stages, which is the conservation measure described in the draft revised LCAS for vegetation management in secondary areas (Interagency Lynx Biology Team 2013, page 83).

In Alternatives 1 and 4, no federal actions will be taken nor will any modification or removal of Canada lynx habitat occur. Alternatives 1 and 4 would be consistent with applicable laws and regulations pertaining to the Endangered Species Act because the continued existence of the Canada lynx will not be affected.

Alternatives 2 and 3 would be consistent with applicable laws and regulations pertaining to the Endangered Species Act.

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. At the Bitterroot National Forest scale, the majority of Canada lynx habitat is protected by wilderness and roadless designation. The protected habitat within the Bitterroot Mountain chain bordering western Montana and eastern Idaho is available for

transient individuals moving from Northwest Montana to new territory. In western portions of Canada lynx habitat, maintaining travel corridors between populations may help ensure long-term viability of isolated populations (Koelher 1990, Koelher and Brittell 1990). Lynx habitat on the Forest is patchy by nature and is considered to be secondary or peripheral habitat. The implementation of Alternative 2 will not impact travel cover or connectivity on a landscape scale for transient Canada lynx to use. No effects from this project would affect viability or result in a trend toward federal listing for the population or species.

Forest Plan

Alternatives 1, 2, 3, and 4 will maintain Canada lynx habitat within the LAU and support the recovery of the species. Protection of Canada lynx was considered during the analysis, but **Alternatives 2 and 3 do not comply with requirements in the Bitterroot National Forest Plan as amended by the NRLMD because Alternatives 2 and 3 do not comply with the standards and guidelines in the NRLMD (see below).** Alternatives 1 and 4 comply with requirements in the Bitterroot National Forest Plan as amended by the NRLMD.

Northern Rockies Lynx Management Direction

Direction in the NRLMD ROD applies to mapped lynx habitat on National Forest presently occupied by lynx, as defined by the Amended Lynx Conservation Agreement between the Forest Service and USFWS (PF-WILD-035). National Forests are encouraged to consider the direction in the NRLMD ROD when designing management actions in unoccupied lynx habitat, such as on the Bitterroot National Forest, but are not required to follow this direction (USDA Forest Service 2007a). This analysis documents the BNF's consideration of NRLMD direction.

The Bitterroot National Forest reviewed the management standards and guidelines in the NRLMD and their application to the Como Forest Health Project (Table 3.3- 13). Table 3.3- 13 shows the standards and guidelines for vegetation management because the Como Forest Health project does not propose livestock management, or recreation, mineral, or highway developments. **Alternatives 2 and 3 do not comply with Standard VEG S6 or Guideline VEG G4, and therefore, these alternatives do not comply with the NRLMD.** For a complete explanation of the standards, guidelines, and definitions, refer to (PF-WILD-044).

All standards and guidelines of the NRLMD are met under Alternatives 1 and 4 because there are no activities proposed in lynx habitat.

Table 3.3- 13: Northern Rockies Lynx Management Direction Standards and Guidelines Compliance Review for Alternatives 2 and 3 of Como Forest Health Project.

NORTHERN ROCKIES LYNX MANAGEMENT DIRECTION:		
STANDARD OR GUIDELINE	IS DIRECTION APPLICABLE?	IF APPLICABLE, HAS IT BEEN MET OR NOT MET? (IF APPLICABLE, BUT NOT MET, EXPLAIN REASONS)
ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL)		
Standard ALL S1 – New or expanded permanent developments and vegetation management projects	Yes	The Como Forest Health project does not propose new or expanded permanent development, but does propose vegetation management so this standard applies. Habitat connectivity is maintained and there are no linkage areas within the project area. Movement between LAUs to the north and south is maintained as there are no treatments in the portion of Blodgett-Lost Horse LAU adjacent to other LAUs. Standard ALL S1 is met.
Guideline ALL G1 – Constructing or reconstructing	No	There is no construction or reconstruction of highways or forest highways within the Como Forest Health

NORTHERN ROCKIES LYNX MANAGEMENT DIRECTION:		
STANDARD OR GUIDELINE	IS DIRECTION APPLICABLE?	IF APPLICABLE, HAS IT BEEN MET OR NOT MET? (IF APPLICABLE, BUT NOT MET, EXPLAIN REASONS)
highways or forest highways across federal land		Project.
Standard LAU S1 – Changes in LAU boundaries	No	There are no changes to LAU boundaries within the Como Forest Health Project.
VEGETATION MANAGEMENT PROJECTS (VEG)		
Standard VEG S1 – Stand initiation structural stage limits	Yes	The standard applies because the Como Forest Health project proposes moderate to high severity burning within lynx habitat. In the Blodgett-Lost Horse LAU, approximately 1,290 acres (6%) is currently in an early stand initiation stage that does not yet provide winter snowshoe hare habitat. The Como Forest Health project will burn 3 acres. Within this LAU, there is no lynx habitat on state or private lands, and so there would be no cumulative effect on early stand initiation structure to be combined with the effects of Como Forest Health project. The cumulative percentage is less than the 30% limitation for this standard. Standard VEG S1 is met.
Standard VEG S2 – Limits on regeneration from timber mgmt. projects	No	No regeneration harvest is proposed in lynx habitat
Guideline VEG G11 – Denning Habitat	Yes	Como Forest Health project will only be occurring in 3 acres of lynx habitat. The majority of the LAU is within the Selway-Bitterroot Wilderness and roadless area where large woody debris and large piles of jack-strawed trees are left to provide denning habitat. Guideline VEG G11 is met.
Standard VEG S5 – Pre-commercial thinning limits	No	No pre-commercial thinning (non-commercial) is proposed in lynx habitat
Standard VEG S6 –Multi-storied stands & snowshoe hare horizontal cover	Yes	This standard is applicable because the Como Forest Health project proposes vegetation management treatment in multi-storied, mature or late successional forest within lynx habitat within the Blodgett-Lost Horse LAU, but outside of the WUI boundary. Horizontal cover board surveys were completed for the Como Forest Health project. Prescribed burning will reduce snowshoe hare habitat in multi-story mature or late successional forests outside of the WUI boundary; more than 200 feet from an administrative site, etc.; for purposes other than research studies or genetic testing; and for reasons other than incidental removal during salvage harvest. Standard VEG S6 is not met.
Guideline VEG G1 – Lynx habitat improvement	No	Treatment in lynx habitat will be done with the purpose of reducing fuel and the recruitment of a high density of conifers, hardwoods and shrubs will therefore not be desirable in this location. However, because stands with a high density of conifers are located around the project area, this habitat planning is not necessary. Guideline VEG G1 is met.

NORTHERN ROCKIES LYNX MANAGEMENT DIRECTION:		
STANDARD OR GUIDELINE	IS DIRECTION APPLICABLE?	IF APPLICABLE, HAS IT BEEN MET OR NOT MET? (IF APPLICABLE, BUT NOT MET, EXPLAIN REASONS)
Guideline VEG G4 – Prescribed fire	Yes	Como Forest Health project proposes to create fire break on a ridge to keep the prescribed fire from continuing into the roadless and wilderness areas. A 20 foot wide fuel break will be created which will act as a corridor for travel and facilitate snow compaction. Guideline VEG G4 is not met.
Guideline VEG G5 – Habitat for alternate prey species	Yes	Red squirrel habitat is provided in the LAU by conifer habitat. There are currently 22,640 acres of conifer habitat within the Blodgett-Lost Horse LAU. Proposed treatments and cumulative effects would result in a potential reduction of 14% of this habitat. Guideline VEG G5 is met.
Guideline VEG G10 – Fuel treatments in WUI	No	Lynx habitat is not within the WUI

¹This review is for Alternatives 2 and 3 only. Alternatives 1 and 4 do not propose any activity within mapped lynx habitat.

² For those areas identified as lynx habitat in the *Occupied Mapped Lynx Habitat Amendment to the Canada Lynx Conservation Agreement* (PF-WILD-035), management direction are the standards and guidelines displayed below. As stated in the ROD (p. 29) unoccupied forests should consider this management direction. Management direction was applied only to mapped lynx habitat in the Como Forest Health Project Area.

³ For detailed explanations of the standards, guidelines and definitions, refer to Attachment 1 of the NRLMD ROD (USDA Forest Service *et al.* 2007a).

3.3.3.6 Summary of Effects

Implementation of Alternatives 1 and 4 would have **no effect** on Canada lynx or their habitat.

Implementation of Alternatives 2 and 3 will alter 3 acres of Canada lynx habitat. Implementation of Alternatives 2 and 3 **may affect, but are not likely to adversely affect** Canada lynx or their habitat (Section 3.3.14).

Sensitive Species

From the Regional Forester's list of sensitive species the following species are analyzed in detail in this part of the wildlife analysis: western big-eared bat, long-eared myotis, long-legged myotis, black-backed woodpecker, fisher, flammulated owl, gray wolf, and western toad as sensitive species. These species and the existing condition and use of their key habitat components are described in this part of the wildlife analysis. The analysis includes descriptions and rationale of the spatial and temporal boundaries, and indicators and potential thresholds of effects.

3.3.4 Bats: (*Corynorhinus townsendii*), (*Myotis evotis*), (*Myotis volans*)

Western big-eared bats (*Corynorhinus townsendii*), long-eared myotis (*Myotis evotis*), and long-legged myotis (*Myotis volans*) and their associated habitat components are described together because their habitats and the potential project effects are similar.

3.3.4.1 Overview of Issues Addressed

Habitat Quantity and Quality

Western big-eared bats are often associated with mesic habitats characterized by coniferous and deciduous forests, but occupy a wide variety of vegetation types, from juniper-pine to high elevation

mixed conifer forests (Barbour and Davis 1969). Their primary habitat is in caves or mines, but they will also use snags for temporary roosts.

Long-eared myotis are often associated with mature or old-growth forest conditions (Foresman 2001). They are known to roost in buildings, mines, caves, and rock fissures. Long-legged myotis primarily roost in caves, mines, and buildings but will use snags with cavities or hollow areas for roosts and nursery sites (Foresman 2001). No caves or tunnels are known to exist within the project area that would be suitable for a nursery or hibernating colony, but large snags containing cavities or hollow areas are common in some lower to mid-elevation areas.

Because these bats rely on or utilize cavities and hollow trees, the quantity of snags is important to the growth and persistence of bats on the landscape. The Como Forest Health project area is considered suitable habitat for these bat species.

Issue Indicators

Limiting landscape factors for these three bat species include the availability of snags for roosting. The potential effect on snags was the evaluation criterion to predict project impacts on these bat species.

3.3.4.2 Regulatory Framework

As stated in the Wildlife Introduction, section 3.3, the regulatory framework for managing bats comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species, which in general terms means, habitat will be provided to support viable populations.

3.3.4.3 Affected Environment

Existing Condition

Legal and Management Status

The Montana Natural Heritage Program and Montana Fish, Wildlife, and Parks (MTFWP) rank the western big-eared bat as a G4 S3 species (MTFWP 2014). The G4 ranking indicates that globally, the western big-eared bat is apparently secure, though the species may be quite rare in parts of its range and/or is suspected to be declining. At a state scale, S3, their status indicates they are potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas. The long-eared myotis and long-legged myotis are classified as G5 S4 species (MTFWP 2014). A G5 S4 ranking indicates that globally, the long-eared myotis and long-legged myotis are common, widespread, and abundant (although it may be rare in parts of its range). In Montana, they are apparently secure, though they may be quite rare in parts of their range, and/or suspected to be declining. Foresman (2001) classifies the long-eared myotis and long-legged myotis as locally abundant and widely distributed in Montana.

Local Habitat Status

Western big-eared bats are often associated with mesic habitats characterized by coniferous and deciduous forests, but occupy a wide variety of vegetation types, from juniper-pine to high elevation mixed conifer forests (Barbour and Davis 1969). They appear to avoid grasslands whenever possible (NatureServe 2014). Caves and abandoned mines are essential for maternity roosts and hibernacula (Foresman 2001) where females form maternity colonies in spring and summer, to bear and raise young (Pearson et al. 1952). Males are more solitary and may venture further out into the forest to forage, and occasionally roost in tree cavities or behind loose bark. This species sometimes roosts in buildings or caves in late summer. Western big-eared bats may move some distance between hibernacula or roosts and foraging areas, but are not considered migratory.

In forested habitats, long-eared myotis are often associated with mature or old growth conditions (Foresman 2001). They roost in buildings, hollow trees, mines, caves, or rock fissures. Small maternity colonies have been found in buildings or in rock crevices (NatureServe 2014). Long-eared myotis forage over water or among trees and shrubs by picking prey from the surface of foliage, bark, rocks, or the ground.

Long-legged myotis are most often associated with montane coniferous forests, although they can also be found in riparian cottonwood woodlots (Foresman 2001). This species roosts in abandoned buildings, under bark and in rock crevices. Nursery sites are often located in hollow trees (NatureServe 2014) and hibernacula are located in caves or mines. Many Montana records come from elevations greater than 6,000' (Hoffmann et al. 1969). Long-legged myotis feed primarily on moths, although they also consume a variety of other insects. They chase prey for relatively long distances around, through, or over the forest canopy, forest clearings, or water (Ibid).

No caves or tunnels are known to exist within the project area that would be suitable for a nursery or hibernating colony. However, there are scree fields and avalanche chutes in and next to the project area, which may provide habitat. Large snags containing cavities or hollow areas are common in some lower to mid-elevation areas throughout the project area.

Local Population Status and Trends

Western big-eared bats have been detected in several of the Bitterroot drainages, and the long-eared myotis and long-legged myotis have been detected in the Bitterroot drainage (see cumulative effects section), but very little is known about their local abundance or distribution. One audio detection of a western big-eared bat occurred at Lake Como near the project area by a MTFWP biologist in August 2006 (K. Dubois, pers. comm.). A few reports from earlier in the century also document western big-eared bats in the Lake Como area (Hoffman et al. 1969, MNHP 2014).

There is at least one record each of long-eared myotis and long-legged myotis overwintering in Montana in a mine, but many individuals probably migrate (Foresman 2001). Long-eared myotis and long-legged myotis occur singly or in small groups in many habitats where suitable roost sites exist.

Threats and Limiting Factors

Like most other North American species of bat, the long-term persistence of these three bat species is threatened by impacts on both roosting and foraging habitat from timber harvest practices and loss of riparian habitat (Western Bat Working Group 2005). Cutting of large snags is of particular concern in Arizona (NatureServe 2014), and it is assumed a concern in other habitats where long-eared myotis are present. Roosts under exfoliating bark may be relatively short-lived resources (New Mexico Department of Game and Fish 1997).

The primary threat of western big-eared bats is related to the disturbance and/or destruction of roost sites (e.g., recreational caving or mine exploration, mine reclamation, and renewed mining in historic districts) (Western Bat Working Group 2005). This species is very sensitive to human disturbance and may abandon roost sites after human visitation (Humphrey and Kunz 1976). In large portions of its western range, the dependence upon abandoned mines has put this species at risk when mine reclamation and renewed mining projects do not mitigate for roost loss, or do not conduct adequate biological surveys prior to mine closure.

At local levels, long-eared myotis and long-legged myotis maternity colonies, hibernacula, and roosts are vulnerable to disturbance and destruction (New Mexico Department of Game and Fish 1997). Human disturbance can be extremely detrimental to bat colonies in general, especially to non-volant young and hibernating adults (New Mexico Department of Game and Fish 1997). Disturbance of breeding colonies during breeding periods can cause young to lose their grasp and fall to their death

while disturbance during hibernation can cause bats to use up stored fat reserves and starve to death.

Overall, there are no major threats known facing the long-eared myotis or long-legged myotis (NatureServe 2014). On local levels, these three bat species may be affected by the closure of abandoned (unsurveyed) mines, recreational caving, some forestry management practices, and activities (such as highway construction, water impoundments, blasting of cliffs for avalanche control) that impact cliff faces or rock outcrops (Western Bat Working Group 1998). They also may be negatively affected by regional insecticide applications. Although there have not been any studies to confirm such impacts, pesticide spraying in forested and agricultural areas could affect the prey base (moths) of these bats (Western Bat Working Group 2005).

White-nose syndrome has not yet been documented as afflicting western big-eared bats, long-eared myotis, or long-legged myotis. However, this fungal disease of bats now occurs throughout much of the eastern portion of the western big-eared bat range (NatureServe 2014).

Desired Condition

The desired condition for bat species within the Como Forest Health project area is to provide habitat to support viable populations of bats and maintain habitat to prevent a decline in the western big-eared bat, long-legged myotis and long-eared myotis populations as described by the regulatory framework listed above.

3.3.4.4 Environmental Consequences

Methodology

For each alternative, the potential effects on snags will be the evaluation criterion used to predict impacts on western big-eared bats, long-legged myotis, and long-eared myotis.

Design Features and Mitigation Measures

Design features incorporated into Alternatives 2, 3, and 4 ensure the provision of snag habitat for western big-eared bats (Chapter 2). Monitoring reports and field notes from previous timber harvest projects on the Bitterroot National Forest substantiate the effectiveness of these features (Forest Plan Monitoring Report 2008).

Incomplete and Unavailable Information

For the western big-eared bat, local and range-wide distribution and status data is needed, as well as, long-term population trends (NatureServe 2014). For long-eared myotis and the long-legged myotis, information is incomplete, both locally and globally. The distribution of roosts, maternity colonies, and hibernacula; trends; and migration patterns are needed for long-legged myotis, and population trends over the last 10 years are needed for long-eared myotis (NatureServe 2014). Information on the abundance, specific threats, and the overall effect of those threats are needed for long-eared myotis and long-legged myotis (NatureServe 2014).

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for western big-eared bats is the Como Forest Health Project area. This analysis area is appropriate to analyze effects from the actions of this project on this species in conjunction with past, present, and reasonably foreseeable future actions because the impacts caused by the proposed activities will be localized around snags being harvested within the project area. Incremental effects of proposed activities of this project on bats outside the project area would not be measurable. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would continue until the snags that are cut or burned during proposed treatments are replaced by recruitment snags. Given the number of snags on the landscape and the ecological processes that are continually occurring to create dead and hollow trees, these effects will be occurring for about a decade.

Broader Context and Trends

In addition to the vocalization heard at Lake Como in 2006 and the specimen collected in 1969, a Bitterroot National Forest bat survey used an audio bat detector to positively identify at least one big-eared bat near the confluence of Meadow Creek and the East Fork Bitterroot River in 2006 (PF-WILD-007). Audio bat detectors positively identified western big-eared bats during December 2012 and April 2013 below the Painted Rocks dam near the spillway and Painted Rocks cliffs along the West Fork Bitterroot River. Hoffman et al. (1969) reported specimens of the western big-eared bat collected northeast of Florence, at the Curlew Mine near Victor and in Hamilton. Others were collected near Victor and the mouth of Kootenai Creek (PF-WILD-007).

Over the entire range, trends showing the past 10 years or three generations of western big-eared bats are uncertain, but overall abundance has probably been slowly declining (NatureServe 2014). Pearson et al. (1952) suggested that the availability of human-made structures may have led to an increase in numbers of this species in parts of the western United States in the past. However, the general concurrence among bat biologists is that there has been a downward trend in abundance of western big-eared bats in the western portion of its range over the past 50 years (Gruver and Keinath 2006). The western big-eared bat was formerly regarded as the second most common species in Utah (Hardy 1941), but more recent surveys found it to be relatively rare (Hasenyager 1980). Major reductions in populations (up to 59 percent) have occurred between 1987 and 1994 at hibernacula in south-central Idaho (Wackenhut 1990, Lewis 1994) and surveys at historical roost sites in California from 1987 to 1991 have indicated a 52 percent reduction in numbers of maternity colonies and a 55 percent decline in number of individuals (Pierson and Rainey 1998). In Oregon, half of the known colonies were believed to have been either extirpated or had experienced substantial decline in numbers (Pierson et al. 1999).

However, giving promise to the long-term status of the species, populations of the subspecies *C. t. virginianus* have increased in recent decades as a result of effective conservation measures. Numbers of hibernating individuals have increased approximately 450 percent since 1984 (USFWS 2008, 2009).

A 2006 Bitterroot National Forest bat survey along Meadow Creek on the Sula Ranger District caught 2 long-eared myotis at each of two sites, and one long-legged myotis at one site and two long-legged myotis at the other site. The same survey also captured one long-legged myotis along Martin Creek near the confluence with Bush Creek and used audio bat detectors to positively identify long-eared myotis along the East Fork Bitterroot River near the confluence of Meadow Creek, and along Bush Creek and Balsam Creek. Audio bat detectors positively identified long-eared myotis during April 2013 below the Painted Rocks dam near the spillway and Painted Rocks cliffs along the West Fork Bitterroot River. Specimens of long-eared myotis and long-legged myotis were collected from numerous locations around the Bitterroot Valley in the 1930s (1940s for long-legged myotis) through the 1960s (PF-WILD-007).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. No known caves or mine adits exist within the cumulative effects area, so the impact of previous activities on these three species of bats

are likely limited to timber harvest activities. Logging altered the forest structure to various degrees, which may have changed available prey abundance. Clearcuts could have created grassland-like habitats that western big-eared bats would avoid. Felling snags in units (or firewood gathering along roads by dispersed campers) may have eliminated some large snags that provided loose bark for roosting individual bats. Reasonably foreseeable activities are summarized in Appendix B.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative. The No Action alternative would not affect western big-eared bat habitat or populations in the short term. This alternative would not affect the availability of roosting habitat for western big-eared bats because it would not change existing habitat conditions.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on snag availability or quality over the short term. The vegetation within the project area would continue to change with natural forces determining stand conditions at a rate that would allow western big-eared bats to adapt to changes at a natural, unnoticeable rate.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore, no cumulative effects would occur either.

Alternatives 2, 3, and 4

Direct and Indirect Effects

Alternatives 2, 3, and 4 would not affect any mines, caves, or tunnels that could provide important habitat for western big-eared bats, long-eared myotis, and long-legged myotis maternal colonies or hibernacula because none of these structures are known to exist within the project area. The alternatives would reduce existing snag densities relative to the area of treatment displayed in Table 3.3- 14. Old-growth stands, which have a high density of snags and hazardous trees, will be treated in Alternatives 2 and 3 and the potential of removing snags for logging safety concerns would disproportionately increase. The retention of old growth stands in alternative 4 would decrease the level of impacts on all three bat species. Snag numbers might also be reduced along new system road, temporary road, and tracked line-machine trail due to safety concerns.

Table 3.3- 14: Treatments in Alternatives 2, 3, and 4 that May Affect Snag Densities and, by Inference, Western Big-eared Bat, Long-eared Myotis, and Long-legged Myotis Habitat Quality.

TREATMENT	ALT. 2	ALT. 3	ALT. 4
Commercial timber harvest (acres)	1,476	1,295	1,117
Non-commercial timber harvest (acres)	531	929	770
Old-Growth treated (acres)	179	92	0
Group selections (acres)	296	162	0
Creation of snags in aspen units	0	0	39
Prescribed fire only (acres)	1,322	953	202
Thinning prior to prescribed fire	531	1,020	743
New system road, temporary road, or tracked-line machine trail	6.3	0	2.4

Group selection harvest units might reduce foraging habitat for western big-eared bat because the bats catch prey in the air near foliage. The forest structure in the other units would be more open than it currently is, but it is difficult to determine whether this change would cause bat prey species and bat foraging opportunities to decline or increase.

Snag retention guidelines in the harvest units would assure that numerous the appropriate levels and sizes of snags would be retained in those units, including larger ponderosa pine and Douglas-fir snags that are more likely to provide the cavities or hollow areas that bats might use for roosting or maternal areas. The project area also contains snags that are not within proposed units, all of which would be retained. Snags left inside and outside of proposed units would provide adequate roosting opportunities for individuals or small groups of bats.

The prescribed fire units could have mixed effects on bat habitat. On one hand, fire could burn down a suitable roost tree (Schultz 2003) or weaken it to such an extent that it would fall shortly after the burn. Also, a fire could burn off bark peeling from a roost, taking away preferred roosting locations on the tree and render the tree unsuitable as a bat roost. The potential loss of roost habitat could occur in low and moderate severity fires, and would most definitely occur in areas like Unit E, where high severity crown fires are predicted. On the other hand, fire-killed trees would create new roosting habitat. Prescribed burning, at any severity, will create more of the grassland habitats that western big-eared bats tend to avoid. Overall, fire may result in both loss and creation of snags (Van Lear 1996). Since these three species of bats evolved in habitats affected by fire, fire is unlikely to have a strong, long-term negative impact on bat populations (BCI 2001).

Not a lot of information exists about the specific effects of burning on these three species of bats, but research on related species provides some insight. Carter and others (Carter et al. 2002) suggest that the benefits to southeastern bats from fire, in any season, that creates snags may outweigh any negative impacts. The effects of burning would be similar for these three species because of their association with snags. Torching from individual trees in an occupied forest stand would likely create gaps in the canopy and increase the amount of solar radiation reaching a roost, which would be preferable to a closed canopy. In addition, opening the canopy or causing tree fall, could improve foraging habitat.

Cumulative Effects

The impacts of proposed management activities in the alternatives are analyzed in the Direct and Indirect Effects section, and are expected to have minor impacts on bat habitat quality or populations. Harvest units and prescribed burning units in the action alternatives may change the prey base or slightly reduce the amount of suitable habitat in the area. These are unlikely to affect the amount of suitable habitat to any measureable extent.

Removing fuel biomass will decrease the risk of major fire events. Fewer high severity fires would improve western big-eared bat habitat in the long-term because they do not forage well in grasslands or large openings. However, a mathematical model developed to analyze wildfire prevention effects on wildlife species suggests that the long-legged myotis would benefit from high severity wildfires through the production of snags and rejuvenation of shrubs (Bogener 2003).

No activities are proposed or reasonably foreseeable in scree fields or avalanche chutes adjacent to the project area that may affect possible bat nurseries or hibernation opportunities. No mines or adits in Ravalli County that may serve as hibernacula or bat nurseries are proposed for closures. Therefore, the minor, potential effects of activities in Alternatives 2, 3, and 4 would not cause cumulative effects on these three species of bats.

3.3.4.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Proposed activities in Como Forest Health Project Alternatives 1, 2, 3, and 4 address Forest Plan standards and other relevant laws, regulations, policies and plans for western big-eared bats in the following manner:

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. Though long-term population trends of western big-eared bats, long-eared myotis, and long-legged myotis are not completely understood, these bats occur regularly in low numbers across their range threats to their range are considered low to moderate (NatureServe 2014). All of the alternatives in the Como Forest Health project would maintain habitat for these bat species.

Forest Plan

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of snags that do not present an unacceptable safety risk. However, almost all snags in harvest units can be considered safety risks so few snags are being left. To compensate for this, design features provide guidance for the appropriate number of snags required for the site and large diameter trees remaining after harvest serve as snag replacements and vertical diversity for sensitive species habitat. Project design features will provide this guidance and have been effective in previous projects (PF-WILD-028). Alternatives 1, 2, 3, and 4 would comply with the forest plan standard for snag densities.

3.3.4.6 Summary of Effects

Implementation of Alternative 1 would have **no impact** on the long-eared myotis, long-legged myotis, and western big-eared bat or their habitat.

Implementation of Alternatives 2, 3, and 4 **may impact individual long-eared myotis, long-legged myotis, and western big-eared bats or their habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to population or species** (Section 3.3.14).

3.3.5 Black-backed Woodpecker (*Picoides arcticus*)

3.3.5.1 Overview of Issues Addressed

Habitat Quantity and Quality

The black-backed woodpecker is an irruptive species, which means its population increases irregularly. The black-backed woodpecker forages opportunistically on outbreaks of wood-boring beetles in recently burned habitats. High snag densities and availability that result from moderate and severe fires are linked to prey persistence and characterize preferred black-backed nesting habitat (Hejl and McFadden 2000). Because of this, Hutto (1995) stated that the black-backed woodpecker appears nearly restricted to post-burn habitat and Murphy and Lehnhausen (1998) postulated that local populations will increase in number in post-burn areas and decrease in unburned areas.

Other research has shown black-backed woodpeckers are also found in areas of insect outbreaks and other unburned forests (Bock and Lynch 1970, Apfelbaum and Haney 1981, Harris 1982, Goggans et al. 1989), but they likely occur at lower densities and viability may not be maintained over time without sufficient post-fire habitat. Large concentrations of trees attacked by mountain pine beetles can provide an abundant foraging opportunity for several woodpecker species, such as the black-backed woodpecker, that scale the bark off of affected trees to reach beetle larvae in the cambium layer beneath. Woodpeckers are drawn to beetle outbreak areas and woodpecker numbers can be much higher in these areas than in areas with endemic levels of bark beetles for the duration of the outbreak.

For these reasons, the Como Forest Health project analyzes both post-fire snag habitat (primary habitat) and insect and disease snag habitat (secondary habitat) for potential effects of proposed

activities on black-backed woodpeckers. Due to the widespread nature of the beetle outbreak within the project area, the entire project area is considered black-backed woodpecker habitat.

Issue Indicators

The analysis for black-backed woodpecker for the Como Forest Health project focuses on two evaluation criteria:

- “ Impacts on snags in high quality, primary habitat (moderate or severe fire areas burned within the last six years), and
- “ Impacts on snags in secondary habitat (patches of insect and disease infestations within the last 6 years)

3.3.5.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing black-backed woodpecker comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

3.3.5.3 Affected Environment

Existing Condition

Legal and Management Status

The black-backed woodpeckers' preference for recently burned forest has led to its listing as an R1 Forest Service sensitive species as its restrictive habitat requirements (e.g., high snag density, wood-boring beetles) make the species vulnerable to local and regional extinction as fire-suppression programs and post-fire salvage logging increase on public lands (Dixon and Saab 2000).

Montana Fish, Wildlife, and Parks (MTFWP) classifies the black-backed woodpecker as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the black-backed woodpecker as a G5 S3 species (MTFWP 2014). This means that across its range the species is considered common, widespread, and abundant (although it may be rare in parts of its range). It is not vulnerable in most of its range. In Montana, the species is considered potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.

Local Habitat Status

The black-backed woodpecker is an irruptive species that forages opportunistically on outbreaks of wood-boring beetles in recently burned habitats. Most research on these birds indicates that they are dependent upon fires, particularly in the Northern Rockies (Hutto 1995, Caton 1996, Hitchcox 1996, Murphy and Lehnhausen 1998, Saab and Dudley 1998, Hejl and McFadzen 2000). The black-backed woodpeckers' preference for recently burned forest has led to its listing as an R1 Forest Service sensitive species as its restrictive habitat requirements (e.g., high snag density, wood-boring beetles) make the species vulnerable to local and regional extinction as fire-suppression programs and post-fire salvage logging increase on public lands (Dixon and Saab 2000).

Post-burn area studies in Oregon, Montana, Idaho, and South Dakota consistently report that wood-boring beetles, which occur in abundance 2 to 8 years following a fire, are an important food source for this species. High snag densities and availability that result from moderate and severe fires are linked to prey persistence and characterize preferred black-backed nesting habitat (Hejl and McFadzen 2000). Because of this, Hutto (1995) stated that the black-backed woodpecker appears nearly restricted to post-burn habitat and Murphy and Lehnhausen (1998) postulated that local populations would increase in number in post-burn areas and decrease in unburned areas.

No large fires (wild or prescribed) have burned within the Como Forest Health project area during the past 10 years (See Fire/Fuels Report for fire history of the area), so there are no recent post-fire areas to provide optimum habitat for black-backed woodpeckers. Additionally, there have been no recent fires within a 0.29-mile radius of the project boundary, which incorporates a 56-acre home range in post fire habitat.

Other research has shown black-backed woodpeckers are also found in areas of insect outbreaks and other unburned forests (Bock and Lynch 1970, Apfelbaum and Haney 1981, Harris 1982, Goggans et al. 1989), but they likely occur at lower densities and viability may not be maintained over time without sufficient post-fire habitat. For example, home ranges for black-backed woodpeckers in beetle-killed forests were estimated to be 1,000 acres (1.5 square miles), compared to an estimated territory size of 56 acres/pair (0.087 square miles/pair) in post-fire habitat (Powell 2000). Some studies indicate that black-backed woodpeckers forage primarily on wood-boring beetles, which may explain this difference in suitability between beetle outbreaks and post-fire habitat. Woodborers are the dominant type of beetle attracted to recently burned areas, where as bark beetles are the primary type of beetle that cause large-scale tree mortality.

However, insect outbreak studies (without fire) have suggested that woodpeckers can be attracted to other insects such as bark beetles when these insects provide an abundant prey base (summarized in Samson 2006). Large concentrations of trees attacked by mountain pine beetles can provide an abundant foraging opportunity for several woodpecker species, such as the black-backed woodpecker, that scale the bark off of affected trees to reach beetle larvae in the cambium layer beneath. Woodpeckers are drawn to areas impacted by intense beetle outbreaks, and woodpecker numbers can be much higher in these areas than in areas with endemic levels of bark beetles for the duration of the outbreak. Arnett et al. (1997a and 1997b) found similar densities of black-backed woodpeckers in mountain pine beetle killed areas as in post-burned areas, further suggesting the species is not "restricted" to post-burns. Hoyt and Hannon (2002) noted that few studies have considered all habitats in proportion to availability nor considered the difficulty in comparing bird densities observed in open post-fire habitats versus bird densities observed in closed canopy and structurally complex, live forests.

Insect infestations within the project area are mainly occurring due to two bark beetles: the mountain pine beetle (MPB) (*Dendroctonus ponderosae* Hopkins) and the Douglas-fir bark beetle (DFB) (*Dendroctonus pseudotsugae*). Aerial surveys done in 2013 to detect mountain pine beetle (MPB) attacks indicate that MPB are still very active near Lake Como and are killing approximately 4-5 TPA (trees per acre) and small groups of 5 to 40 trees in both lodgepole pine and ponderosa pine. The majority of these attacks in and near the project area have occurred within the past four years. In unit E, aerial surveys detect MPB are killing 5-10 TPA, and in unit 36, surveys detect that 3 TPA from MPB (See Vegetation report for further explanation of MPB activity in the project area. When considering a broader 23,614 acre area to incorporate the project area and a 1.5 mile radius beyond the project boundary (representing the birds' 1,000 acre home range in a beetle-killed habitat), aerial flights have detected mountain pine beetle attacks across the west side of the Bitterroot Mountains. This recent outbreak of mountain pine beetle has created hundreds of new lodgepole pine snags across the Bitterroot National Forest. MPB larvae are generally present in trees for a year after the initial beetle attack, but the ongoing nature of the pine beetle outbreak could continue to provide foraging opportunities for large numbers of woodpeckers for several years.

According to the 2013 Montana Forest Insect and Disease Conditions and Program Report, mountain pine beetle activity across the state has decreased from the previous year, returning to endemic levels. It is still, however, causing extensive tree mortality in both ponderosa and lodgepole pine trees in many areas, most notably the Bitterroot National Forest where groups of 100 to 300 MPB-

killed trees were observed scattered throughout Ravalli County (PF-WILD-012). Table 3.3-15 summarizes the tree mortality from 2013 on the Darby Ranger District.

Local Population Status

Forest personnel have detected numbers of woodpeckers foraging in the stands surrounding the Como Forest Health project area that have been affected by bark beetles. Most of the woodpeckers detected were pileated woodpeckers or hairy woodpeckers. No black-backed woodpeckers were observed, but it is likely that some occupy the project area.

Table 3.3- 15: Forest Mortality, Defoliation, and Other Damage on Darby Ranger District, 2013

DARBY RD	ACRES	TREES
Douglas-fir Beetle	669	2,422
Mountain Pine Beetle (PP)	6,387	19,522
Mountain Pine Beetle (LPP)	22,420	159,573
Subalpine Fir Mortality	21	70
MPB (High Elev. 5-needle pines)	1,965	2,991
Western Spruce Budworm	1,364	0

Bird banding data gathered at two locations that are within and outside of the project area indicates that black-backed woodpeckers have not been captured over the past 20 years, nor have they been observed visually or audibly. For perspective, Table 3.3- 16 summarizes woodpecker captures at both MAPS (Monitoring Avian Productivity and Survivorship program) sites for the past 20 years. All of the species listed below are much more common than black-backed woodpeckers outside of burned forests, and aside from red-naped sapsuckers, they are relatively uncommon captures at the stations.

Table 3.3- 16: Woodpecker Captures at Rock Creek and Lick Creek MAPS Sites, 1993-2013

SPECIES	# BANDED	# RECAPTURES	# UNBANDED
Red-naped Sapsucker	149	91	1
Downy Woodpecker	48	8	1
Hairy Woodpecker	10	1	0
Northern Flicker	6	0	0
Pileated Woodpecker	2	0	0

Threats and Limiting Factors

Timber harvest, fire suppression, removal of fire-killed or insect-infested trees, and the conversion of mature and old-growth forests to young stands with few decayed trees pose significant threats to this species (Goggans 1989). Fire suppression has dramatically altered the diversity of habitats across North American forested landscapes and severely reduced the amount of early post-fire habitat available to this and other fire-dependent species, such as black-backed woodpeckers.

Desired Condition

The desired condition for black-backed woodpeckers within the Como Forest Health project area is to provide habitat to support a viable population of black-backed woodpeckers as described by the regulatory framework listed above.

3.3.5.4 Environmental Consequences

Methodology

The analysis for black-backed woodpecker for the Como Forest Health project focuses on two evaluation criteria:

- “ Impacts to snags in high quality, primary habitat (moderate or severe fire areas burned within the last six years)
- “ Impacts to snags in secondary habitat (patches of insect and disease infestations within the last six years).

Fire history GIS data was compiled by the Bitterroot National Forest and aerial insect detection surveys were done by the Regional Office across the Forest. The silviculture report (section 3.1) describes the details and limitations for these surveys.

Incomplete and Unavailable Information

An accurate count of the number of black-backed woodpeckers within the project area is unknown.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for black-backed woodpeckers incorporates the project area and a 1.5-mile radius beyond the project boundary. This analysis area is appropriate to analyze any incremental effects from the actions of this project on black-backed woodpeckers directly, indirectly, or in conjunction with past, present, ongoing and reasonably foreseeable future actions because this area will include any home ranges of woodpeckers utilizing the project area. Effects of proposed activities of this project to woodpecker populations outside of this effects area would not be measureable. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would continue until the snags that are cut or burned during proposed treatments are replaced by recruitment snags. Given the ecological processes that are continually occurring to create dead trees and the projections surrounding recent beetle outbreaks, these effects of the alternatives will not last long into the future.

Trends and Broader Context

The Montana Natural Heritage Program and MTFWP rank the black-backed woodpecker as a G5S3 species (Montana Field Guide 2014). This is an improvement from the previous S2 state ranking for this species, which may reflect the huge increases in the amount of burned habitat created by wildfires in Montana since 1999. Dixon and Saab (2000) suggest that the species is increasing in numbers in the United States.

Successful fire suppression reduced the amount of primary black-backed woodpecker habitat available for woodpeckers over the past several decades (Caton 1996). Hillis et al. (2003) reported that the amount of black-backed woodpecker habitat created by fire across Region One in 2000 was 258% of the mean historic range of variability for six-year periods from 1940 to 1999. Samson (2006) reported that black-backed habitat (post-fire and insect outbreaks) has increased substantially across the Region in the last decade (from 278% on the Kootenai to over 300,000% on the Flathead). Samson (2006) also found that no gap between current post-burn or insect-infested (with no burn) areas has occurred that would limit black-backed woodpeckers from interacting Region wide. Median dispersal distance for this species is estimated to be about 65 miles, although they are known to travel farther than this during irruptions. This dispersal distance indicates that black-backed woodpeckers across the entire Region belong to a single, well-connected population. Although no population estimates are available, the large amount of apparently suitable and well-distributed habitat across the Region combined with the interconnectedness of the population indicates that short-term viability of black-backed woodpeckers across the Region is not an issue (Samson 2005).

Furthermore, a recent state insect and disease condition report shows dramatic increases in tree mortality due to some non-fire causes from 2008 to 2010 (PF-WL-012). Across all federal ownership in Montana, mountain pine beetle mortality was evident on over 1,298,000 acres of lodgepole pine and 19,000 acres of ponderosa pine in 2008. In 2010, the area affected by mountain pine beetle-caused tree mortality increased to 1,430,000 acres of lodgepole pine and almost 98,000 acres of ponderosa pine (ibid). Across the same area, Douglas-fir beetle mortality in Douglas-fir stands declined somewhat from about 21,700 acres in 2008 to about 16,000 acres in 2010 (ibid). These areas containing trees recently killed by bark beetles in relative density are available as secondary habitat that could support lower numbers of black-backed woodpeckers than recently burned areas. Given the recent climate trend towards warmer, drier weather, it is likely that fires and insect outbreaks will continue to create abundant habitat for black-backed woodpeckers.

Habitat models based on burned areas estimate that the Bitterroot National Forest contained sufficient post-fire habitat to support between 1,100 to 2,000 pairs of black-backed woodpeckers in the period from 2000 to 2003 (Samson 2005), although the portion of this habitat that burned in 2000 has since lost its suitability. Areas of insect outbreaks offer additional potential habitat. This habitat and more recently created post-burn habitat is well-distributed across the Bitterroot National Forest as a result of the widespread fires in 2003 and 2007, plus smaller acreages that burned in 2005, 2006, 2009 and other years. In 2004, six active black-backed woodpecker nests were located in areas burned during 2003 on the north half of the forest (Forest Plan Monitoring Report 2008).

At a Forest-wide scale, it is estimated that between 2000 and 2003, there were 373,600 acres of black-backed woodpecker habitat more than what is necessary to maintain a minimum viable population, which is estimated to be 330 individuals (Samson 2005, Samson 2006). In other words, the Bitterroot National Forest contained an estimated 1,370% of the habitat necessary to maintain a minimum viable population of black-backed woodpeckers on the Forest. Since that time, the Forest has experienced several major wildfires and insect outbreaks, recruiting more suitable habitat for woodpeckers.

Snags are probably more abundant now on the Bitterroot National Forest than at any time since the Forest was created. The fires of 2000 burned across approximately 307,000 acres of the Bitterroot National Forest, creating millions of new snags. About 46 percent of this area burned with moderate or high severity where the majority of trees were killed and turned into snags. In the 54 percent of the area that burned with low severity, up to about 40 percent of the trees were killed as either individuals or small groups. The fires resulted in a large pulse of snags analogous to similar pulses created by large fires prior to active fire suppression. While the fires of 2000 may have been characteristic for some areas across the landscape, other areas across the landscape had higher levels of stand replacing fires (in warm dry habitat types) than would have been expected historically. This resulted in a higher mortality in large ponderosa pine – generally a fire resistant species – than is characteristic for that fire regime.

The recent trend towards a drier, warmer climate has resulted in frequent fires on the Bitterroot National Forest, which creates regular pulses of snags that provide suitable habitat for black-backed woodpeckers. Wildland fires have burned 248,900 acres on the Bitterroot National Forest since 2003, creating snag habitat across the Forest (Table 3.3- 7).

Many of the fires burned in Wilderness or Roadless areas, and burned under minimal suppression efforts. Portions of these fires that burned at moderate or high severity created suitable habitat for black-backed woodpeckers. Snags on a high percentage of these burned areas will never be harvested because they are in wilderness or roadless areas, or are otherwise difficult to access.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. No fires have recently occurred within the cumulative effects area to create primary habitat. Previous timber harvest in the Como Forest Health project area may have removed some secondary habitat for black-backed woodpeckers if it targeted trees killed by bark beetles. Most previous harvest in this area probably had little impact on existing black-backed woodpecker habitat since it occurred prior to recent major bark beetle infestations and tended to focus on removing green trees. Fire suppression has reduced the size of fires in the past but has also created stand conditions that may favor uncharacteristically large fires today.

Reasonably foreseeable activities are summarized in Appendix A.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the no action alternative.

Indirect Effects

Alternative 1 would not reduce existing snag numbers, and would therefore not affect the amount of secondary habitat available for black-backed woodpeckers in the short term. Existing population levels of black-backed woodpeckers would likely decline over time as the number of trees killed by mountain pine beetles decline. The risk of high severity fire would increase as stand density increases and forest canopy closes. Trees would become more susceptible to insect and disease pathogens as competition for nutrients and water increase. A large-scale, moderate to severe fire would create abundant, if temporary, habitat for black-backed woodpeckers. The large numbers of snags and abundant beetle populations created by these conditions would likely attract and support a large population of black-backed woodpecker for several years.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore there are no cumulative effects either.

Alternatives 2, 3, and 4

Design Features and Mitigation Measures

Design features to maintain snag habitat are described in Chapter 2. Monitoring reports and field notes from previous timber harvest projects on the Bitterroot National Forest substantiate the effectiveness of these features (Forest Plan Monitoring Report 2008).

Direct and Indirect Effects

None of the alternatives would affect black-backed woodpecker primary habitat because there are no recent moderate or severe burned areas within the project area. Commercial harvest, especially in old-growth stands, and road and trail construction would reduce the habitat quality of currently suitable secondary habitat as shown in Table 3.3- 17 by alternative. Commercial timber harvest would remove recently killed and currently infested trees in the process of achieving the desired stand density and structure. Old-growth units, which have a high density of snags and hazardous trees, will be treated in Alternatives 2 and 3, and disproportionately increase the amount of snags that would potentially be removed for safety concerns. Snag numbers might also be reduced along 6.3 miles of new system road, temporary road and tracked line-machine trail due to safety concerns.

Table 3.3- 17: Treatments that may Affect Black-backed Woodpecker Secondary Habitat in the Como Forest Health Project Area.

TREATMENT	ALT. 2	ALT. 3	ALT. 4
Commercial harvest (acres)	1,476	1,295	1,115
Old-growth treated (acres)	179 (191)	92 (143)	7 (0)
Road and trail construction (miles)	6.3	0	2.3
Prescribed fire mod-high severity	661	347	0

Although the snag retention guidelines would retain sufficient snags in these units to support reduced numbers of most woodpecker species, removing some or most of the existing snags would result in poor quality habitat for black-backed woodpeckers. This species seems to prefer high snag densities, and is rarely found in burned areas that have been partially salvaged (Hejl and McFadzen 2000).

The prescribed burning units could have mixed effects on black-backed woodpecker habitat. On one hand, fire could burn down existing snags (Schultz 2003), but the burning could also create new snags. Unit E has a high level of MPB-caused mortality, which creates a large amount of black-backed woodpecker habitat in the Como Forest Health project area. Burning in this unit is likely to create a high-severity crown fire and is predicted to create even more snags. Unit E would not be burned under Alternative 4 so snags created by MPB infestation would remain until a wildfire burned through the unit and creates primary habitat.

In Alternative 4, aspen treatments would create snags by girdling trees on 39 acres and prescribed fire may also create snags on the periphery of aspen units 73 and 74 (about 18 acres) as fire is allowed to creep through the units. Burn units A, B2, and C2 will be thinned before burning, reducing the severity of the prescribed burn, and lessening the chances of losing snags during implementation.

Overall, Alternatives 2, 3, and 4 could cause a reduction in the number of black-backed woodpeckers the project area is capable of supporting in the short-term. In the long-term, these alternatives would reduce the risk of large, high-to moderate intensity fire, which could provide a large amount of suitable habitat and could potentially attract large numbers of black-backed woodpeckers for up to eight years after a fire occurred, and longer into the future if a fire return interval was followed.

Cumulative Effects

The impacts of management activities proposed in this EA are analyzed in Direct and Indirect Effects section and are expected to have impacts to habitat quality or populations. Fires will continue to be allowed to burn in the wilderness and roadless area with minimal suppression efforts, creating suitable habitat for black-backed woodpecker. Because of the travel restrictions in these areas, any snags that would be created would never be harvested. The MPB infestation will continue across the Forest, particularly in areas that have not been harvested, creating secondary habitat for black-backed woodpeckers also.

3.3.5.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

All of the alternatives would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. Black-backed woodpeckers are estimated to have a median dispersal distance of about 65 miles, although they are known to travel farther than this during irruptions. This dispersal distance indicates that black-backed woodpeckers across the entire Region belong to a single, well-connected population. Although no population estimates are

available, the large amount of apparently suitable and well-distributed habitat across the Region combined with the interconnectedness of the population indicates that short-term viability of black-backed woodpeckers across the Region is not an issue (Samson 2005).

Forest Plan

Alternative 1 would meet the direction from the Bitterroot Forest Plan because no snags would be removed from the project area, and snag habitat would be maintained for snag associated and snag-dependent wildlife species.

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of snags that do not present an unacceptable safety risk. However, almost all snags in harvest units can be considered safety risks so few snags are being left. To compensate for this, design features provide guidance for the appropriate number of snags required for the site and large diameter trees remaining after harvest serve as recruitment snags replacements and vertical diversity for sensitive species habitat. Project design features will provide this guidance and have been effective in previous projects (PF-WILD-028). Alternatives 2, 3, and 4 would comply with the forest plan standard for snag densities.

3.3.5.6 Summary of Effects

Implementation of Alternative 1 would have no impact on black-backed woodpeckers or their habitat.

Implementation of Alternatives 2, 3, and 4 may impact individual black-backed woodpeckers or their habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to population or species (Section 3.3.14).

3.3.6 Fisher (*Martes pennanti*)

3.3.6.1 Overview of Issues Addressed

Habitat Quantity and Quality

Fisher habitat can be grouped into two categories: Resting/denning/foraging habitat and other foraging habitat. Resting/denning/foraging habitat includes mature mesic forest stands with dense canopy cover, abundant snags and coarse woody debris, as well as densely forested riparian areas. This habitat is thought to be the most crucial habitat for fishers, given their daily needs for resting sites and the importance of denning sites for reproduction. Key elements within this habitat seem to be structures used for reproductive dens and resting sites, which are typically among the largest available trees, snags, and logs. Conservation measures for fisher must ensure that these important large, old structures are maintained where they exist and promoted where they are scarce or lacking. Because re-use of rest sites is infrequent, and fishers rest multiple times a day as they travel throughout their home ranges, conservation measures should ensure an abundance of well-distributed suitable rest structures across the landscape, and within the vegetation types used by fishers (Lofroth et al. 2010).

Other foraging habitat includes younger mesic forest stands with dense canopy cover (>40%). These stands may have an abundance of prey species, and may provide foraging habitat in winter (Jones 1991). Because of fishers' daily needs for resting sites, these younger stands should be interspersed with older, more structurally complex stands with remnant larger trees, snags, and coarse woody debris piles within them.

Maintaining a diverse and well-distributed mix of successional stages across a 6th code HUC is important for fisher conservation as fishers use a wide variety of forest structures for resting,

denning, foraging, and movement. There are approximately 2,196 acres of resting/denning/foraging habit and 644 acres of foraging habitat within the Como Forest Health project area.

Issue Indicators

Because fishers rely on resting and denning structures and are sensitive to human disturbance, the following evaluation criteria were used to predict impacts to fishers for each alternative:

- Amount and type of habitat (foraging, resting, and denning),
- Snag and coarse woody debris densities for resting and denning structures, and
- Amount of undisturbed habitat not treated in the project area.

3.3.6.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing fisher comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

3.3.6.3 Affected Environment

Existing Condition

Legal and Management Status

Fishers are classified as a Montana Species of Concern, but are also managed as furbearers with annual quotas. The Montana Natural Heritage Program and Montana Department of Fish, Wildlife and Parks (MTFWP) rank the fisher as a G5 S3 species (MTFWP 2014). This means that at the global scale, the species is considered to be common, widespread, and abundant (although it may be rare in parts of its range), and not vulnerable in most of its range. In Montana, the species is considered potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas.

Local Habitat Status

As stated above, fisher habitat can be grouped into two categories. It is currently unknown what proportion of each of these habitat types is needed within a fisher's home range.

Resting/Denning/Foraging habitat includes mature mesic forest stands with dense canopy cover, abundant snags, and coarse woody debris, as well as densely forested riparian areas. This habitat type is thought to be the most crucial habitat type for fishers, given their daily needs for resting sites and the importance of denning sites for reproduction. Other Foraging Habitat includes younger mesic forest stands with dense canopy cover (>40%). These stands may have an abundance of prey species, and may provide foraging habitat in winter (Jones 1991). Because of fishers' daily needs for resting sites, these younger stands should be interspersed with older, more structurally complex stands and have remnant larger trees, snags, and coarse woody debris piles within them.

Fisher habitat, based on the R1 Fisher Habitat model, in the project area is displayed in Figure 3.3-10. In the Como Forest Health project area there are 2,196 acres of Resting/Denning/Foraging habitat and 644 acres of Other Foraging habitat. The average density of fishers on the landscape can range from one individual every 750 – 5000 acres depending on the season and quality of the habitat (Arthur et al. 1989). The project area currently contains enough habitat for three fishers at the highest density.

With the exception of units 18, 19, 22A, 23, 23A, 60, 66, 66A and A, all treatment units are located within fisher habitat.

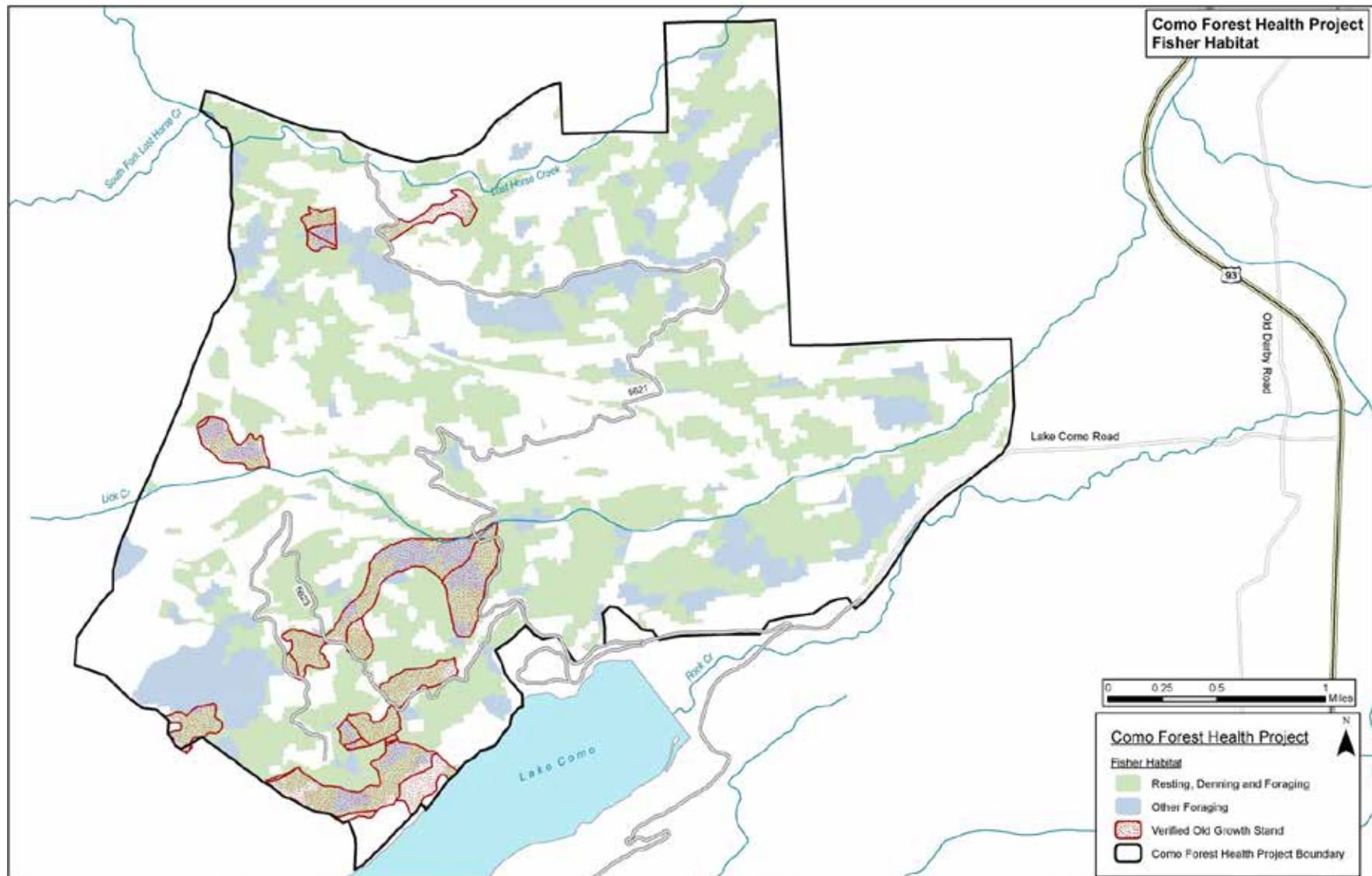


Figure 3.3- 10: Fisher Habitat Present in the Como Forest Health Project Area.

The analysis area incorporates the three 6th code watersheds, which intersect the project area. These three watersheds (Bitterroot River – Lick Creek, South Lost Horse Creek, and Rock Creek) total 90,708 acres and contain 10,241 acres of fisher habitat within their boundaries. The majority of the habitat is found along the canyon bottoms in the riparian areas and along the foothills of the Bitterroot Mountains (PF-WILD-046).

At the Forest level, there are 223,460 acres of fisher habitat (170,424 acres of Resting/Denning/Foraging and 53,036 acres of Other Foraging) (USDA Forest Service 2012a). Fisher habitat is found in most of the west side canyons and lower elevations in the Bitterroot Mountains (Figure 3.3- 10).

Local Population Status and Trends

Monitoring fishers is difficult, and the appropriate scale for monitoring and detecting fishers is often larger than a project area. Fishers occupy large home ranges (10,000 acres for females and 20,000 acres for males) that do not overlap within sexes, and they occur at low densities. Because of this, a substantial effort has been made since 2004 to monitor fishers in Region 1 (USDA Forest Service 2012b).

Fishers have been identified near the project area through fur harvest in 1985, 1993, and 1999, incidental harvest in 2002 and 2010, and non-invasive DNA samples in 2009 (Figure 3.3- 11). Multiple-carnivore bait stations (stations to identify different carnivore species) were set-up throughout the project area during the winter of 2012-2013, but fisher were not recorded at any of the stations (PF-WILD- 047).

Threats and Limiting Factors

No single dominant threat to fisher distribution or abundance has been identified. Rather, a host of anthropogenic and natural events can negatively affect fishers, and they are evaluated as associated with the proposed management actions.

Trapping is considered one of the most important factors influencing fisher populations because fishers are easily trapped, and low levels of harvest have the potential to negatively affect small, local populations (USFWS 2011). Trapping is the primary known source of fisher mortality (USDA Forest Service 2012c). Unregulated overharvest in the past contributed to severe fisher population reductions in the Northern Rockies, to the point where populations were thought extirpated.

Timber harvest and thinning, as well as prescribed fire, have the potential to alter fisher habitat suitability by reducing habitat size, amount, and distribution, or changing the forest structure to be unsuitable for fishers. Forest management that removes or fragments late-successional forests will likely have the greatest effects on fishers because key fisher habitat components are well developed in these forests.

Additionally, roads and other linear features act as semi-permeable filters or as impermeable barriers to fishers and may prevent population expansion and gene flow (Woods and Munro 1996). Roads also cause direct fisher mortality through vehicle collisions and potentially increase access of fisher predators (e.g. mountain lions, black bears) and trappers (Naney et al. 2012).

Projected changes in climate such as increasing temperatures, earlier spring run-off, and more precipitation falling as rain than snow, could cause a wide range of changes in the forested environments on which fishers depend. Preliminary predictions based on a few different climate change scenarios show slight shifts in available fisher habitat in Region 1, but perhaps not a dramatic decrease in habitat (Olson et al. 2014). Additionally, while disturbances such as fire and forest diseases can promote important habitat features for fishers, including creating snags and woody

debris, extensive and intense regional fires or defoliating events could reduce the amount of forest cover preferred by fishers (USFWS 2011).

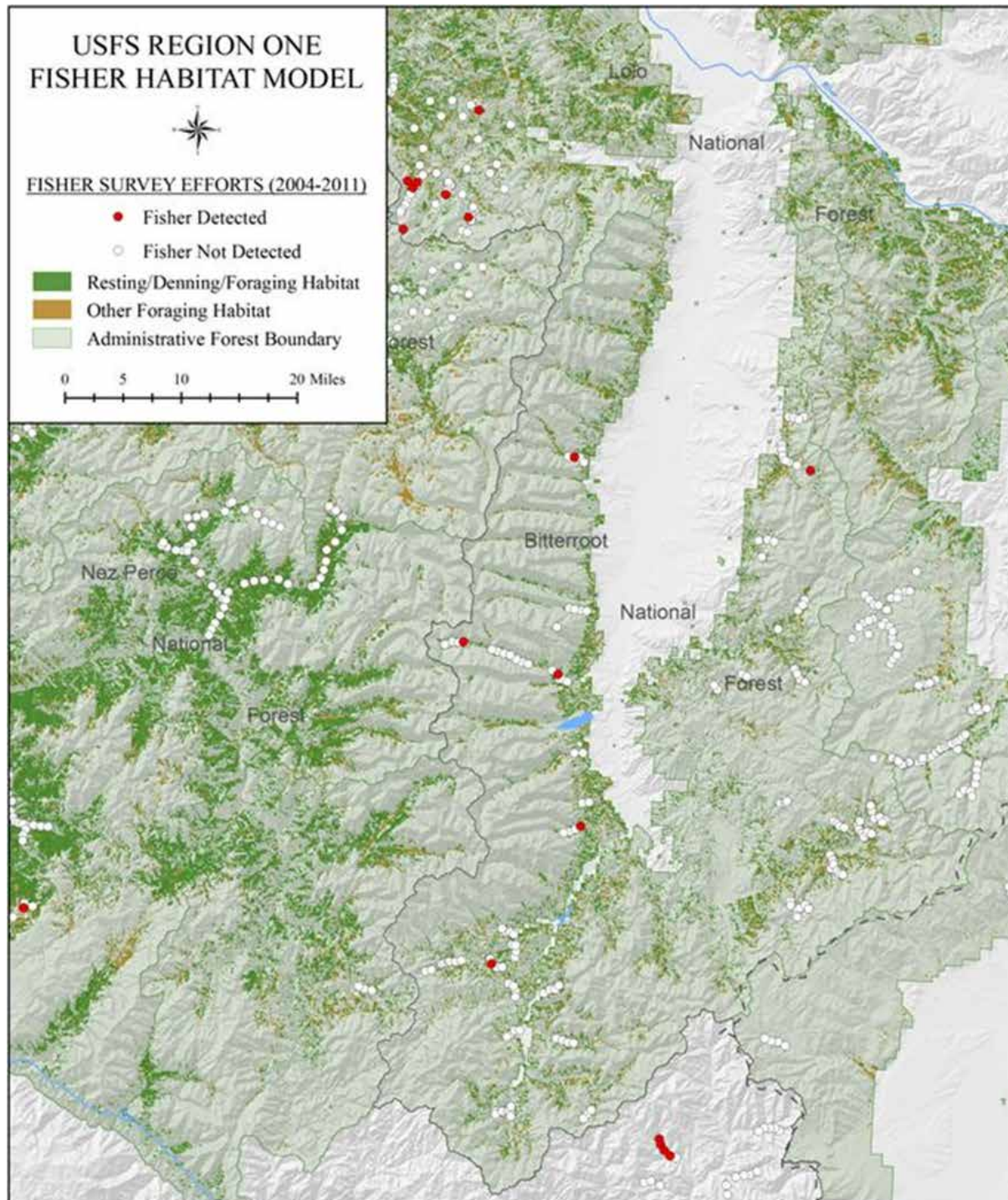


Figure 3.3- 11: Fisher Habitat Present in the Como Forest Health Project Area.

Desired Condition

The desired condition for fisher in the Como Forest Health project area is to provide habitat that supports a viable population of fishers and maintains habitat to prevent a decline in the fisher population as described by the regulatory framework.

3.3.6.4 Environmental Consequences

Methodology

For each alternative, the following evaluation criteria were used to predict impacts on fishers:

- “ Amount and type of habitat (foraging, resting, and denning; other foraging),
- “ Snag and coarse woody debris densities for resting and denning structures, and
- “ Amount of undisturbed habitat not treated in the project area.

Habitat was initially mapped using the 2013 R1 Fisher GIS data for the project area. Finer project level field data was collected during the summers of 2012 and 2013 within the project boundaries, and was subsequently incorporated into the model. An explanation of how VMap and FSveg were used to run the model, along with metadata from the R1 model can be found in the project file (USDA Forest Service 2012a, PF-WILD-048).

Resting/Denning/Foraging habitat was defined as:

- “ Potential Natural Vegetation types: Grand Fir dry, Grand Fir moist, Subalpine Fir moist, Spruce, Douglas-fir moist, Douglas-fir cool dry, Western Red Cedar wet, Western Red Cedar moist, and Western Hemlock habitat types;
- “ Canopy cover over 40%;
- “ Size class over 10” dbh; and
- “ Fire Groups: 5, 6, 9, 10, and 11.

Other Foraging habitat was defined with similar attributes except the size class was reduced to include only vegetation from 0.0 -9.9” dbh. Explanations for the R1 Fisher Habitat Model can be found in USDA Forest Service (2012a) and PF-WILD-048.

Resting and denning structures were measured through relative snag and coarse woody debris densities and distribution pre- and post-treatment in stands identified as fisher habitat. Snag habitat is discussed in detail in the Snag section, and coarse woody debris is discussed in detail in the Soils section. Undisturbed habitat was measured as available habitat not proposed for treatment or ground-disturbing activities in the project area.

Incomplete and Unavailable Information

Project-level field data is available only for the project area, not for the entire analysis area. The 2013 R1 Fisher GIS data was used to evaluate habitat outside of the project area but within the analysis area boundaries. This level of data is sufficient because when project level field data was incorporated into the R1 model for the project area; additional habitat was identified that was not identified at the coarser scale. So, it is assumed that this outcome would be similar for the larger analysis area.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for fisher includes the three 6th code watersheds that intersect the project area (Bitterroot River-Lick Creek, South Lost Horse Creek, and Rock Creek watersheds). This area totals 90,708 acres and is appropriate to analyze any incremental effects from the actions of this project on fisher directly, indirectly or cumulatively. Fisher home ranges in Montana and Idaho are among the largest home ranges reported for fishers, with females averaging approximately 10,000 acres, and males averaging approximately 22,000 acres (Jones 1991). Thus, the analysis area of 90,708 acres is large enough to include 4 – 9 fisher home ranges and is representative of effects of timber harvest, prescribed and natural fires, and natural tree mortality. The area is large enough to evaluate the ability of the landscape to support fisher, but small enough not to obscure the effects of

the alternatives. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of Alternatives 2, 3, and 4 on fisher habitat would continue until the canopy cover and understory structure in the stands within or around the treatment areas recovered to be considered suitable fisher habitat, in approximately 30 years.

Disturbance impacts would only be in effect while the management activities were occurring.

Broader Context and Trends

Fishers were historically found throughout the montane and boreal forests across North America in Canada extending south through the United States (U.S.) into New England, the Great Lakes area, and along the Appalachian, Rocky, and Pacific Coast Mountains. The contemporary distribution has contracted compared to the presumed historical range in some areas, although the fisher distribution in the northern Rocky Mountains of the U.S. is thought to be similar to the presumed historic range (USFWS 2011).

Unregulated overharvest and indiscriminate predator control have been implicated in past range reductions and local extirpations (USFWS 2011). Fishers were so rare in the U.S. Northern Rockies by the 1920s that they were considered extirpated from the region. A series of fisher reintroductions in Montana and Idaho, from 1959 to 1992, restored fishers too much of their range. Vinkey et al. (2006) revealed the presence of a remnant population of fishers in the Selway-Bitterroot region, as evidenced by a genetic haplotype that is not found in fishers elsewhere throughout their range. Contemporary fishers show genetic links to both the source populations for the reintroductions, as well as to the native remnant population (Vinkey et al. 2006).

Fisher populations in the U.S. Northern Rocky Mountains have increased in numbers and distribution since their perceived extirpation in the 1920s (USFWS 2011). However, there is no information on the historical numbers or density of fisher populations in the region, and little is known of regional population numbers today (USFWS 2011). What little is known of fisher population numbers is primarily derived from harvest data (from both legal and incidental trapping), and from recent survey efforts using non-invasive DNA sampling.

Current fisher distribution in the Northern Rockies is similar to historic distribution (USFWS 2011). Trapping records and data from recent surveys for fishers indicate a lack of fisher presence east of the Continental Divide in Montana (USDA Forest Service 2012b). Fisher presence has been consistent in the Bitterroot Mountains and in the Cabinet Mountains since the 1980s, and sporadic in the Whitefish, Flathead, and Swan Mountain Ranges (Vinkey 2003; MTFWP 2010). In Idaho, fishers are found in the Selkirk Mountains in the north, the Clearwater and Salmon River Mountains in central Idaho, and the Bitterroot Range, including the Selway-Bitterroot Wilderness, in the north-central portion of the state (USFWS 2011). Fishers are thought to be one of the lowest-density carnivores in Montana (Vinkey 2003), although densities appear to vary throughout the Northern Rockies.

Systematic fisher surveys in the Northern Rockies began in 2004 using non-invasive DNA collection techniques (Schwartz et al. 2006), and have continued annually at various locations in the region (USDA Forest Service 2012b). Fishers have been detected at 222 snares in the 8 years of survey, out of 4,813 snares deployed. This number only shows detections; the actual number of individuals is likely lower, given that one individual can visit multiple snares. These fisher survey methods were designed only to detect fisher presence and to provide information on distribution; they do not provide an estimate of population size or trend.

Harvest data from Montana have been used to suggest population trend, although such results should be interpreted cautiously, given the inherent biases of trapping, and the lack of rigor for determining scientifically valid population estimates. Trapping records from Montana show a consistent yearly harvest of roughly seven to nine individuals, with 198 fishers trapped in Montana since 1983 and a high proportion of younger animals represented in the harvest (MTFWP 2010). These data suggest that reproduction is occurring in Montana. MTFWP (2010) suggests that the younger age dominated harvest is indicative of a low harvest rate, and MTFWP further interprets that limited track survey data and harvest records indicate a consistent population status over time.

The Bitterroot National Forest participated in a Regional pilot study designed to determine fisher presence within 25 square mile grids each year from 2007 through 2013. Locations of where the surveys were performed are shown on Figure 3.3- 11 (PF-WILD-050). Fishers were detected in Lost Horse drainage, Trapper Creek, Bear Creek, Tough Creek, and in the Burnt Fork drainage. Additionally, the Forest performed multiple-carnivore surveys using bait stations during the winters of 2012 – 2013 and 2013 – 2014. These stations detected fishers in the White Cap drainage and along the Magruder Crossing road in the Selway-Bitterroot Wilderness. Other recent fisher sightings have been confined to the Bitterroot Mountains.

Fishers are known to be highly vulnerable to trapping and susceptible to overharvest (Powell 1979). Montana is the only state in the western U.S. that still allows limited trapping of fishers. MTFWP trapping records indicate that between 1996 and 2003, the average number of fishers taken by trappers annually was 7.6 across Montana, 6.5 within MTFWP Region 2, and 2.6 within Ravalli County (PF-WILD-004). From 2004 through 2010, the average number of fishers taken by trappers annually was 7 across Montana, 5.7 in MTFWP Region 2, and 2.7 within Ravalli County (PF-WILD-005). Trappers removed 110 fishers from Montana between 1996 and 2010. The current MTFWP trapping regulations allow a quota of 7 fishers per year statewide, with a female sub quota of 2. District 2, which includes Ravalli and Granite Counties and portions of Missoula, Powell, Deer Lodge, Lewis and Clark, and Mineral Counties, has a quota of 5 fishers annually (PF- WILD-051).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Over the past century, regeneration timber harvest in suitable fisher habitat eliminated fisher habitat in the project area and created in highly fragmented fisher habitat. Fishers are associated most frequently with relatively unfragmented, late-successional forest (Powell and Zielinski 1994). Hargis et al. (1997) found that highly fragmented landscapes supported few if any resident marten, even though forest connectivity was still present. Assuming that fisher numbers decline in fragmented landscapes similar to marten, fisher habitat in many drainages within the cumulative effects area may be too fragmented to support a resident fisher population.

The road system built to access these timber sale units also allows easier access to the area for summer and winter recreational users, who may disturb or kill fishers. The road system also facilitates winter access for trappers, who, as harvest records indicate, may harvest fishers from portions of the area and thus reduce the local fisher population.

Successful fire suppression may have allowed many forested stands in the cumulative effects area to mature and become better fisher habitat than they might have under the influence of the historic fire regime, which would typically produce a mosaic of burned and unburned stands over time. However, the buildup of fuels allowed by fire suppression suggests that if a fire occurs in the area now it could be uncharacteristically severe in size and intensity. If this occurred, it could eliminate large areas of fisher habitat for 50 or more years.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on fisher habitat over the short term. In the short term, habitat quality would improve at lower elevations as forest dominated by Douglas-fir mature, crown closures increase and coarse woody debris accumulates. The risk of a high severity fire would increase as stand density canopy closure, and fuel loads created by insects and pathogens increases. A large scale, moderate to severe fire would eliminate fisher habitat. Bark beetles and root diseases that kill large spruce and Douglas-fir trees create potential denning and resting trees. These trees may not be used unless the stand conditions needed for foraging are present nearby.

As wildfires would generally continue to be suppressed in the Como Forest Health project area, many forested stands would mature and become better fisher habitat than they might have under the influence of the historic fire regime. The historic fire regime would typically produce a mosaic of burned and unburned stands over time. However, the buildup of fuels from fire suppression suggests that if a fire occurs in the area, it could be uncharacteristically severe in size and intensity. If this occurred, it would eliminate large areas of fisher habitat for 50 or more years.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore, there are no cumulative effects.

Alternatives 2 and 3

Design Features and Mitigation Measures

The design of all action alternatives, Alternatives 2, 3, and 4, includes provisions to maintain snags and coarse woody debris at levels that represent the historic ranges for specific habitat types and fire groups (Chapter 2). Monitoring reports and field notes from previous projects done on the Bitterroot National Forest substantiate the effectiveness of these features (Forest Plan Monitoring Report 2008).

Direct and Indirect Effects

Over half of the fisher habitat within the project area would be treated in Alternatives 2 and 3, though about 8 to 10 % less habitat would be treated in Alternative 3 (Table 3.3- 18). Alternatives 2 and 3 would treat 63 and 55% of the Resting/Denning/Foraging habitat, respectively and 73 and 66%, respectively, of the Other Foraging habitat in the project area. Fisher habitat outside of the treatment units would be fragmented in areas along the western half of the project area in sizes that would be too small to provide denning habitat or be defensible territory (Figure 3.3- 12, Figure 3.3- 13, and Figure 3.3- 14, respectively).

The implementation of Alternatives 2 and 3 would potentially decrease the amount of both types of fisher habitat within the project area. Both the commercial harvest and moderate to high-severity prescribed burning (Unit E) would reduce canopy cover in fisher habitat to below 40%, particularly in units with a high density of fuels (Table 3.3- 19). This reduction in canopy cover would convert existing fisher habitat to non-habitat in the short term, with the area potentially becoming Other Foraging habitat in the future. Reducing canopy cover in stands with a high amount of structural diversity, especially those in moist or mesic forest types, may decrease a fisher's ability to move through the forest stand, reduce a fisher's ability to detect and capture prey, and increase a fisher's vulnerability to predators and extreme weather conditions (Naney et al. 2012).

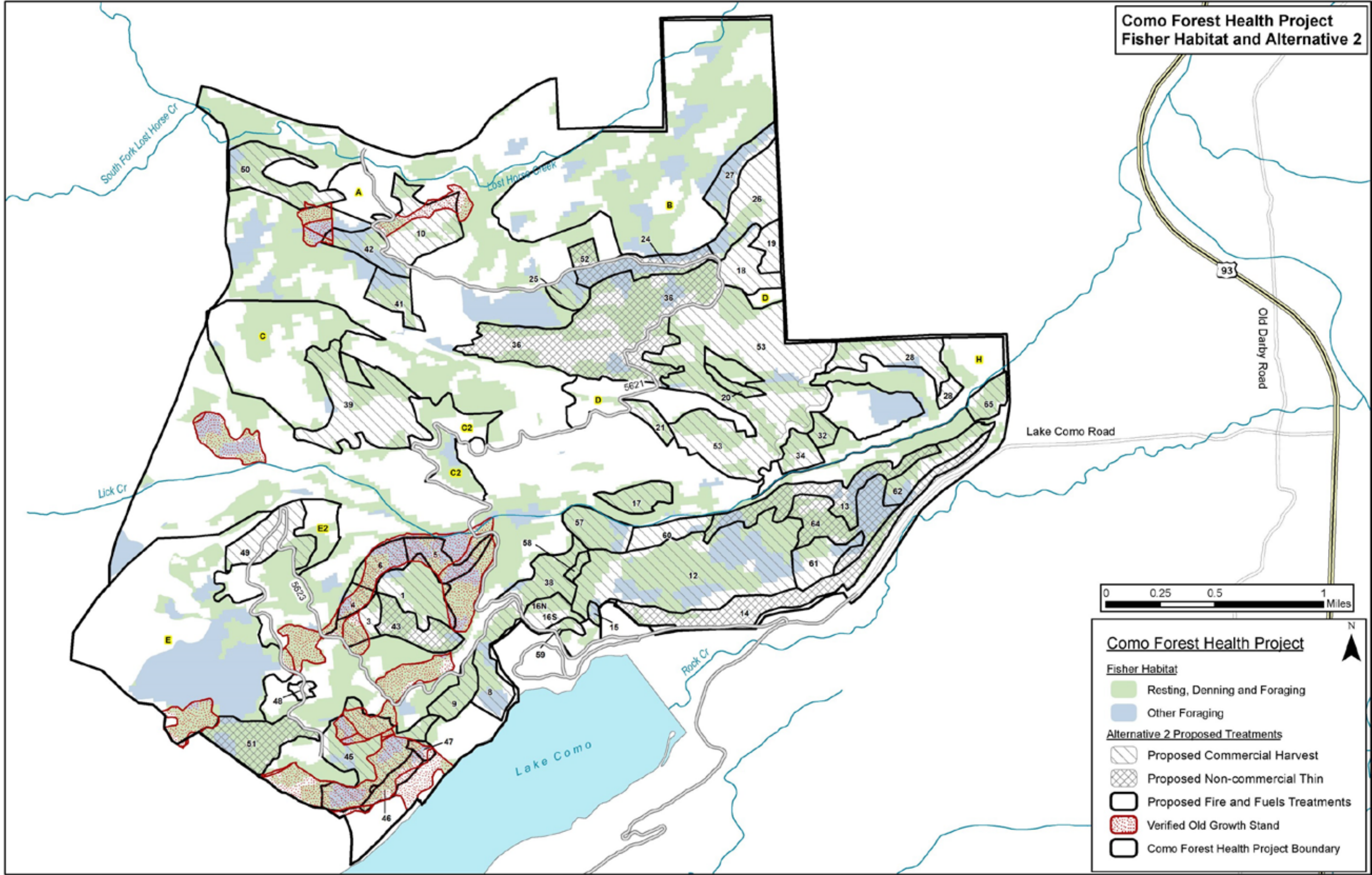


Figure 3.3- 12: Fisher Habitat and Proposed Treatments for Alternative 2

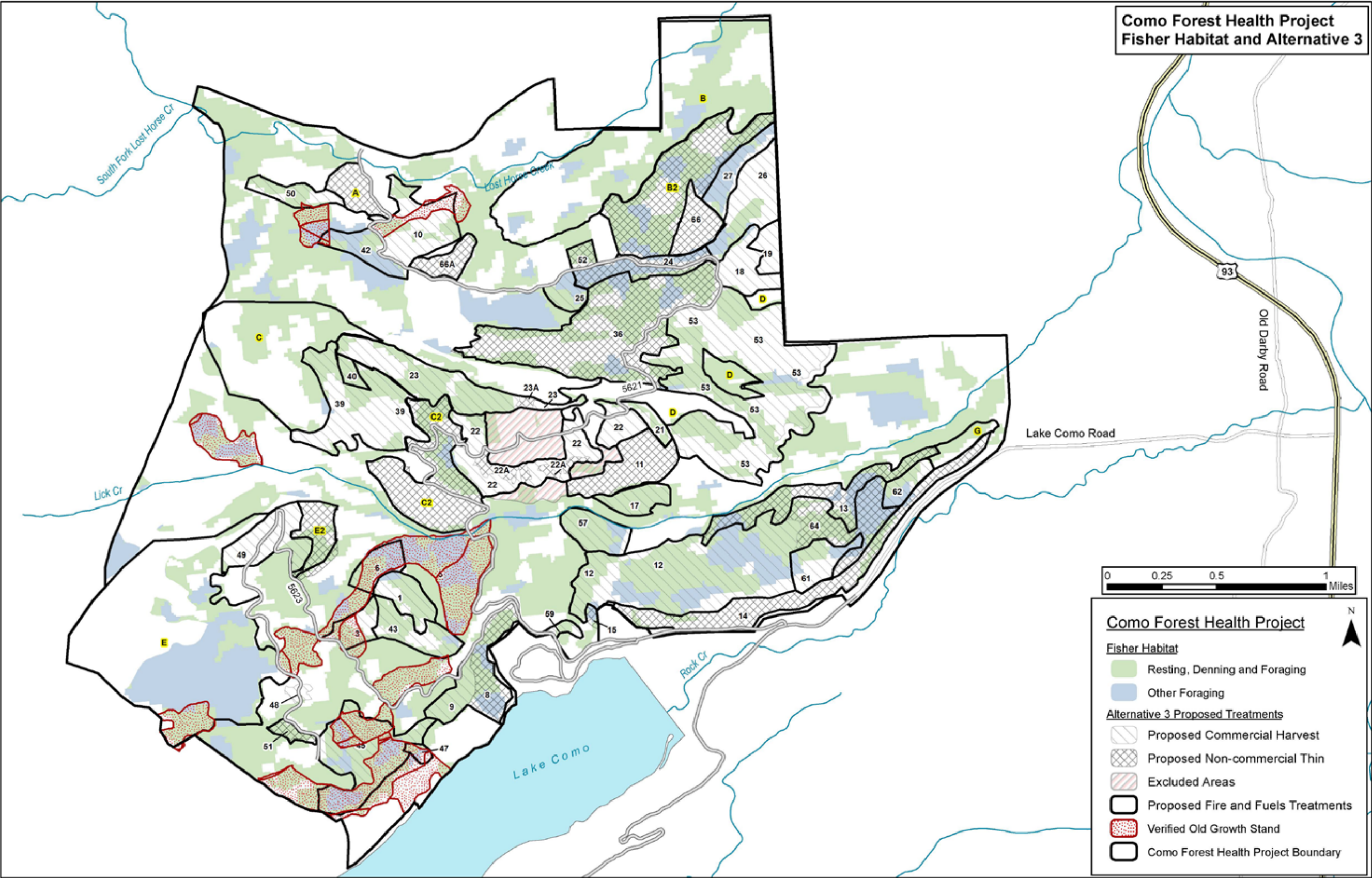


Figure 3.3- 13: Fisher Habitat and Proposed Treatments for Alternative 3

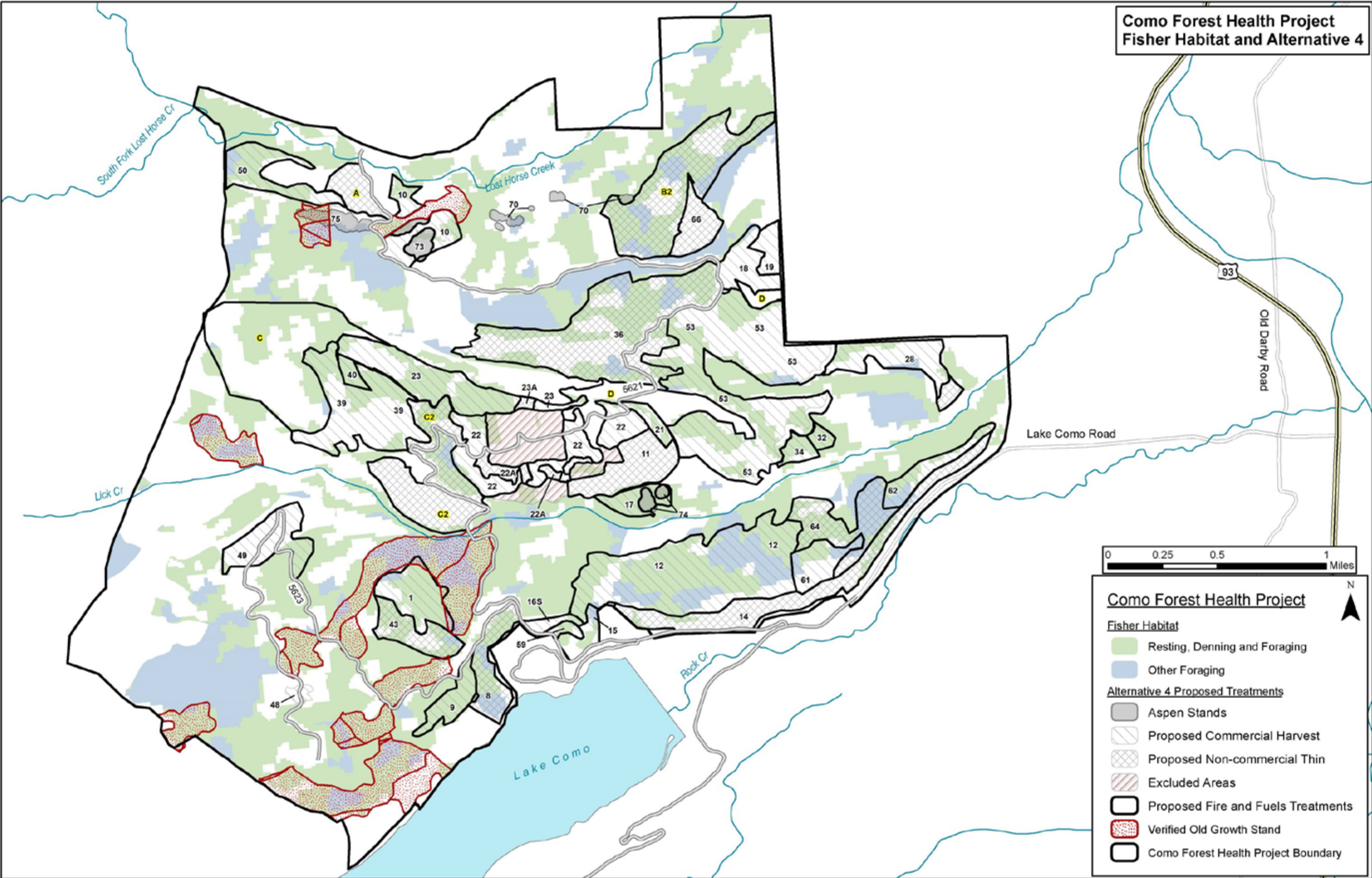


Figure 3.3- 14: Fisher Habitat and Proposed Treatments for Alternative 4

Table 3.3- 18: Fisher Habitat Treated in Alternatives 2, 3, and 4

	RESTING/DENNING/ FORAGING (AC)			OTHER FORAGING (AC)			TOTAL HABITAT (AC)		
	ALT. 2	ALT. 3	ALT. 4	ALT. 2	ALT. 3	ALT. 4	ALT. 2	ALT. 3	ALT. 4
EXISTING CONDITION	2,196			644			2,840		
Commercial	697	597	485	206	160	85	903	757	570
Non-commercial	239	320	273	83	116	82	322	436	355
Fire Only	450	301	73	182	148	2	632	449	75
TOTAL HABITAT TREATED	1,386	1,218	831	471	424	169	1,857	1,642	1,000
UNDISTURBED HABITAT	810	978	1,365	173	220	475	983	1,198	1,840

Table 3.3- 19: Potential Treatment Effects on Fisher Habitat for Alternatives 2, 3, and 4

TREATMENT TYPE	REDUCTION IN CANOPY COVER	MODIFIED FISHER HABITAT (ACRES)			POTENTIAL EFFECT ON FISHER
		ALT 2	ALT 3	ALT 4	
Group Select Units	25%	266	143	NA	Increase in patchiness of habitat, but stands would still provide Resting/Denning/Foraging habitat.
Commercial Units	40%	637	614	570	Decrease in canopy cover to below 40% in most units. Decrease in denning and resting structures. Change to Other Foraging habitat.
Non-commercial Thin Units	No change	322	436	355	Decrease fisher prey densities (i.e. snowshoe hares). No change in current habitat type.
Moderate to high severity burn (Fire Unit E)	50%	189	189	NA	Decrease in canopy cover to below 40%, denning structures and snags. Change to Other Foraging habitat.
Low to moderate severity burn Fire (Units B and C)	20%	323	NA	NA	Decrease in canopy cover, but would remain over 40%. Some denning structures and snags removed. No change in current habitat type.
Low severity burn (Rest of units with Rx burning)	No change	1,343	923	713	Understory trees would be killed, but there would be little change in canopy coverage.

Non-commercial thinning will lead to a potential decrease in prey densities of species such as snowshoe hares, but will not change the current habitat type of the unit.

Alternative 2 and 3 would decrease the amount of resting and denning habitat through the removal of structural components used for such purposes. Silvicultural prescriptions focus on removing trees infested with mistletoe in order to improve the overall health of the forest. Large trees with mistletoe, brooms, and gnarls are undesirable because of their slow growth rate, poor form, and the potential to spread the disease. However, fishers use these structures for resting, hunting, and protection from predators. Fishers need to rest frequently and the distribution of resting habitat throughout the project area is important.

Additionally, old growth forest units (units 3, 4, 5, 6, 10, 45, 46, 47) have a relatively higher density of resting and denning structures than non-old growth stands. Harvest followed by an understory burn is proposed in these units under Alternatives 2 and 3, except units 4, 5, and 46 would not be treated

in Alternative 3. The treatments would reduce the availability of resting and denning structures (Old growth section). Trees in old growth units have a higher potential to develop heartwood decay, which creates tree cavities critical to fisher reproduction. Removing these structures from treatment units would decrease the suitability of the habitat present in those stands.

Snag retention and coarse woody debris design features would ensure adequate levels of snags and coarse woody debris that may provide resting, denning, and foraging habitat will be retained in the treated units. Although the density and quality of the retained structures would be less than the existing condition, adequate habitat structures would be present. Effects on snags for each alternative are discussed in detail in the Snag Report. Effects on coarse woody debris for each alternative are discussed in the Soils Report.

Prescribed burning without pre-treating the units (particularly units B, C, and H) has the potential to increase the severity of the proposed burn. This could reduce the number of large trees, snags, and coarse woody debris. The loss of these stand components would decrease fisher habitat quality by removing potential resting and den sites, as well as habitat for prey species. In units that would be commercially thinned prior to burning, the mature stand structure, large-diameter trees, and snags would be retained, which would enhance the development of key structures fishers require.

Prescribed burn units B2, C2, and E2 would be thinned before burning. This will improve the conditions in the units so they are appropriate for a low severity burn. Fewer of the larger snags, trees, and coarse woody debris components would be consumed in a low severity fire, which would preserve these key features of fisher habitat.

Although the majority of the fisher habitat within the three 6th code watershed is somewhat fragmented and restricted to the riparian bottoms, the habitat within the project area runs north-south and connects the habitats located along Rock Creek and Lost Horse Creek. Fisher presence has been repeatedly verified in the Lost Horse Creek drainage (PF-WILD-052). The treatments proposed in Alternatives 2 and 3 would disrupt this connection and impede travel between the two areas. The amount of undisturbed habitat remaining in the project area would be approximately 35 and 42% of the existing condition, respectively, which is insufficient to support a resident fisher. While it is not known how many fishers, if any, are using the project area, decreasing the quality of the habitat available within the project area and disconnecting a travel corridor between Lost Horse Creek and Rock Creek would limit the use from any fishers dispersing into the area.

In Alternatives 2 and 3, ground disturbing activities such as road construction, mechanical thinning, commercial timber harvest, and prescribed burning could occur on 1,386 and 1,218 acres of suitable fishers denning or resting habitat, respectively, during the breeding and early kit-rearing season (late April through mid-July). Since this area represents a little over 10% of a female fisher's home range, and the analysis area includes enough habitat for a minimum of 4 female fishers, it is unlikely that a female fisher would be denning in the proposed treatment units. However, if a female fisher were to den in the area during harvest, there is a high likelihood that she will be displaced due to the fragmented nature of quality denning habitat and the reduction of available and undisturbed habitat within the project area. The duration of this disturbance would most likely impact one reproductive season, unless treatment required multiple entries. Disturbance could potentially cause the loss of 1-3 kits from the fisher population for each reproductive season in which it occurs.

Cumulative Effects

The impacts of management activities proposed in Alternatives 2 and 3 are analyzed in the Direct and Indirect Effects section, and are expected to have some negative effects on the quality and distribution of fisher habitat.

Fire suppression activities may have allowed many forested stands in the cumulative effects area to mature and become better fisher habitat than they might have under the influence of the historic fire regime. The historic fire regime would typically produce a mosaic of burned and unburned stands over time. However, the buildup of fuels from fire suppression suggests that if a fire occurs in the area now, it could be severe in size and intensity. A severe fire could eliminate large areas of fisher habitat for 50 or more years. Fires will continue to be suppressed within the project area, but may be allowed to burn in the wilderness and roadless area in the larger analysis area.

Previous timber harvest in suitable fisher habitat over the past 150 years in the project area reduced fisher habitat in areas and fragmented fisher habitat across the landscape. As a result, fisher habitat in many of the drainages within the project area may already be too fragmented and isolated to support a resident fisher population.

The Lost Horse road provides easy snowmobile access throughout the winter to trappers, who have harvested fishers from portions of the area and may have reduced the local fisher population.

Alternative 4 – Proposed Action

Direct and Indirect Effects

Less than half (35%) of the fisher habitat would be treated in the project area under Alternative 4, and most of the habitat would be treated by commercial timber harvest. This alternative would treat 38% of the Resting/Denning/Foraging habitat and 26% of the Other Foraging habitat within the project area (Table 3.3- 18). The fisher habitat outside of the treatment units would be connected to habitat within and outside of the project area (Figure 3.3- 14).

The effects of treatments in Alternative 4 would be similar to those described for Alternatives 2 and 3 (Table 3.3- 19) but much less fisher habitat would be affected and connections between areas of habitat would be maintained (Figure 3.3- 14). Prescribed burn units would be thinned before burning, which would create appropriate conditions for a low severity fire. Low severity fire would reduce the loss of snags, large trees, and coarse woody debris and retain the components of quality fisher habitat. All burning will be low severity, which will have less of an impact on fisher habitat than moderate-high severity fires proposed in Alternatives 2 and 3 (Meyer 2007).

Old Growth units will not be treated and will continue to provide Resting/Denning/Foraging habitat. These units would also continue to be at risk for a high severity fire, if an ignition occurred that could not be suppressed. However, units around the old growth units would be treated, which would decrease the risk of severe fire (Old Growth section). Units approaching old growth status would also not be treated and would be old growth recruitment stands for future fisher habitat.

The amount of undisturbed habitat remaining in the project area would be approximately 65% of the existing condition. The undisturbed habitat would be connected to other suitable fisher habitat within and outside of the project area and would be adequate to support resident fishers.

In Alternative 4, ground disturbance during the breeding and early kit-rearing season (late April through mid-July) would have less of an impact due to the amount of connected and undisturbed habitat left in the project area. If needed, additional patches of denning habitat are located well within a female fisher's daily movement capabilities, offering undisturbed denning and kit-rearing habitat in the case of displacement. The loss of kits due to disturbance would be unlikely.

Cumulative Effects

Cumulative effects would be similar to those in Alternatives 2 and 3.

3.3.6.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diverse plant and animal communities and ecological sustainability. A comparison of habitat required for a minimum viable fisher population and available habitat indicates that well-distributed habitat is far in excess to that needed across the Region, given the natural distribution of species and their habitats as mapped by the Montana Natural Heritage Program and the scientific literature. At the Forest scale, habitat modeling based on Potential Natural Vegetation and R1 VMap data estimates that the Bitterroot National Forest contains 148,434 acres of fisher habitat less than the amount conservatively estimated as necessary to maintain a minimum viable population. This level of habitat is about 60% of the amount needed to maintain a minimum viable population of 50 individuals (Samson 2005, Samson 2006, Smallwood 1999). However, the amount of fisher habitat in Region 1 is estimated at 6.1 million acres, well above the most conservative minimum threshold amount (USDA Forest Service 2012). Thus, at the Regional scale, fisher habitat is abundant enough to support 61 fishers. However, given the natural distribution of habitats and large home ranges, the Bitterroot National Forest is not the appropriate scale to maintain a viable fisher population. The alternatives in the Como Forest Health project would not increase the effects on fisher or their habitat from global climate change or fire suppression. The action alternatives, Alternatives 2, 3, and 4, may reduce the effects of climate change and fire suppression by reducing fuel loads and maintaining the historic fire return interval. Fires from natural ignitions would have a higher potential to be low severity, which would conserve key fisher habitat components, as well as, reduce the potential of high severity fire in the forests with longer fire return intervals. Therefore, all the alternatives would not affect fisher viability or result in a trend towards federal listing for the population or species.

Forest Plan

No snags would be removed under Alternative 1.

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of snags that do not present an unacceptable safety risk. However, almost all snags in harvest units can be considered safety risks so few snags are being left. To compensate for this, design features provide guidance for the appropriate number of snags required for the site and large diameter trees remaining after harvest serve as snag replacements and vertical diversity for sensitive species habitat. Project design features will provide this guidance and have been effective in previous projects (PF-WILD-028). Alternatives 2, 3, and 4 would comply with the forest plan standard for snag densities.

Design features are also included for the retention of coarse woody debris based on historic levels for habitat types and fire groups. Coarse woody debris levels would increase at a natural rate under Alternative 1.

3.3.6.6 Summary of Effects

Implementation of Alternative 1 would have no impact on the fishers or their habitat.

Implementation of Alternatives 2, 3, and 4 may impact individual fishers or their habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to population or species (Section 3.3.14).

3.3.7 Flammulated Owl (*Otus flammeolus*)

3.3.7.1 Overview of Issues Addressed

Habitat Quantity and Quality

Based on current literature, flammulated owls are associated with mature to old growth ponderosa pine (*Pinus ponderosa*)/Douglas-fir (*Pseudotsuga menziesii*) forests at lower elevations in the Rocky Mountains. The owls are found in mature open park-like stands with some understory shrubs and small trees (McCallum 1994). In general, flammulated owls nest in relatively large trees in relatively open areas. They are not typically associated with burned areas or extensive beetle-killed trees, probably due to the lack of physical and biological components needed to support both the owls and the insects they prey on.

Forest composition of favored areas where flammulated owls repeatedly forage suggests the importance of old ponderosa pine or ponderosa pine and Douglas-fir in the foraging behavior of the owl. Old ponderosa pine forests (whether pure or mixed with other species) typically form open stands with well-developed grass or shrub understories, as long as frequent fires are allowed to limit invasion of shade-tolerant conifers. These understories support arthropods for food in a forest layer that is used extensively by fledged owlets and molting adults in late summer (Reynolds and Linkhart 1992).

Flammulated owls primarily prey on noctuid (night flying) moths in the early spring, and crickets, grasshoppers, moths and beetles in the summer (McCallum 1994). The openness of foraging stands also provides space for hawking flying insects between crowns and for hover-gleaning them from outer needle bunches (Reynolds and Linkhart 1987).

Reynolds and Linkhart (1992) reported that males sang from hidden positions next to tree trunks or in dense clumps of foliage, and that ponderosa pine and Douglas-fir were the only species used as song trees. Security cover is provided by regenerating Douglas-fir thickets and large-diameter, old, long-standing trees with heavy branching. These features are utilized by both foraging and roosting owls for cover from predators (van Woudenberg 1999, including extensive internal citations).

Flammulated owls depend on woodpeckers to create nesting cavities, usually in large dead trees. Reynolds and Linkhart (1992) state that in reports that described or photographed forests surrounding nests, all nests were in or adjacent to mature or old growth stands (Hanna 1941, Bull and Anderson 1978, Cannings et al. 1978, Hasenyager et al. 1979, Cannings 1982, Bloom 1983, Reynolds and Linkhart 1984, Reynolds and Linkhart 1987, Fix 1986, Goggans 1986, Hayward 1986, Howie and Ritcey 1987, McCallum and Gehlbach 1988). However, Hasenyager et al. (1979) and Bloom (1983) reported nests in forests that had been partially cut but contained large, residual trees; and Winter (1974) found the owl in second-growth forests, although they did not report nesting in this age-class (Reynolds and Linkhart 1987).

Because of the reported association of flammulated owls with mature and dead trees, the availability of mature and older forest structure is important to the growth and persistence of flammulated owls on a landscape. There are approximately 3000 acres of suitable flammulated owl habitat and approximately 1400 acres of potential flammulated owl habitat within the Como Forest Health project area. Old growth habitats are of particular importance for them.

Issue Indicators

Because flammulated owls are habitat specialists, habitat quantity is used as an evaluation criterion to predict project effects. Limiting factors for flammulated owls include the availability of snags and trees for nest cavities and disturbance during peak breeding season (June and July). The following evaluation criteria are used to predict impacts on flammulated owls:

- “ Stand structure, composition, and density of potential and suitable habitat
- “ Snag density of potential and suitable habitat
- “ Temporary disturbance in suitable habitat

3.3.7.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing flammulated owl comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

3.3.7.3 Affected Environment

Existing Condition

Legal and Management Status

Flammulated owls are classified as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the flammulated owl as a G4 S3B species (MTFWP 2014). This means that at the global scale, the species is considered to be uncommon but not rare (although it may be rare in parts of its range), and usually widespread. It is apparently not vulnerable in most of its range, but there is possible cause for long-term concern, particularly from habitat loss. At the state scale, the breeding population is considered to be potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas.

Local Habitat Status

Suitable habitat provides the components and forest structure necessary to meet the needs of flammulated owls, while potential habitat may not currently provide habitat but has the potential to develop into suitable habitat.

Wildlife queries of the FSVEG database indicate that the project area contains 3,009 acres of suitable habitat and 1371 acres of potential habitat. The suitable habitat is distributed across the project area, and located in the Lost Horse, Lick Creek, and Rock Creek drainages and away from the private land boundary (Figure 3.3- 15). All of the old growth stands within the project area are considered to suitable habitat. Two stands of suitable habitat along the western boundary of the project area are probably too small and isolated to support an owl territory, but the rest of the suitable habitat within the project area is moderately connected and functional. The areas of potential habitat fill in the gaps between the suitable habitats and extend to the east, connecting to the private land boundary (Figure 3.3- 15).

With the exception of units 41, 42, 48 and 51, all harvest units are located within suitable or potential flammulated owl habitat.

Local Population Status and Trends

The Bitterroot National Forest does not have population estimates for flammulated owls within the Como Forest Health project area. Call-back surveys were done in the project area during the summer of 2013, and no owls were detected.

Wright (1996) identified populations of flammulated owls in suitable habitats in the Bitterroot Mountains in 1994 and 1995, and the Avian Science Center conducted systematic surveys for flammulated owls in 2005 and 2008 throughout Region 1, including the Bitterroot National Forest. Flammulated owls were well distributed in suitable habitat on the southern half of the Forest, but on only a few transects on the northern half. There were no transects from these survey efforts within the project area.

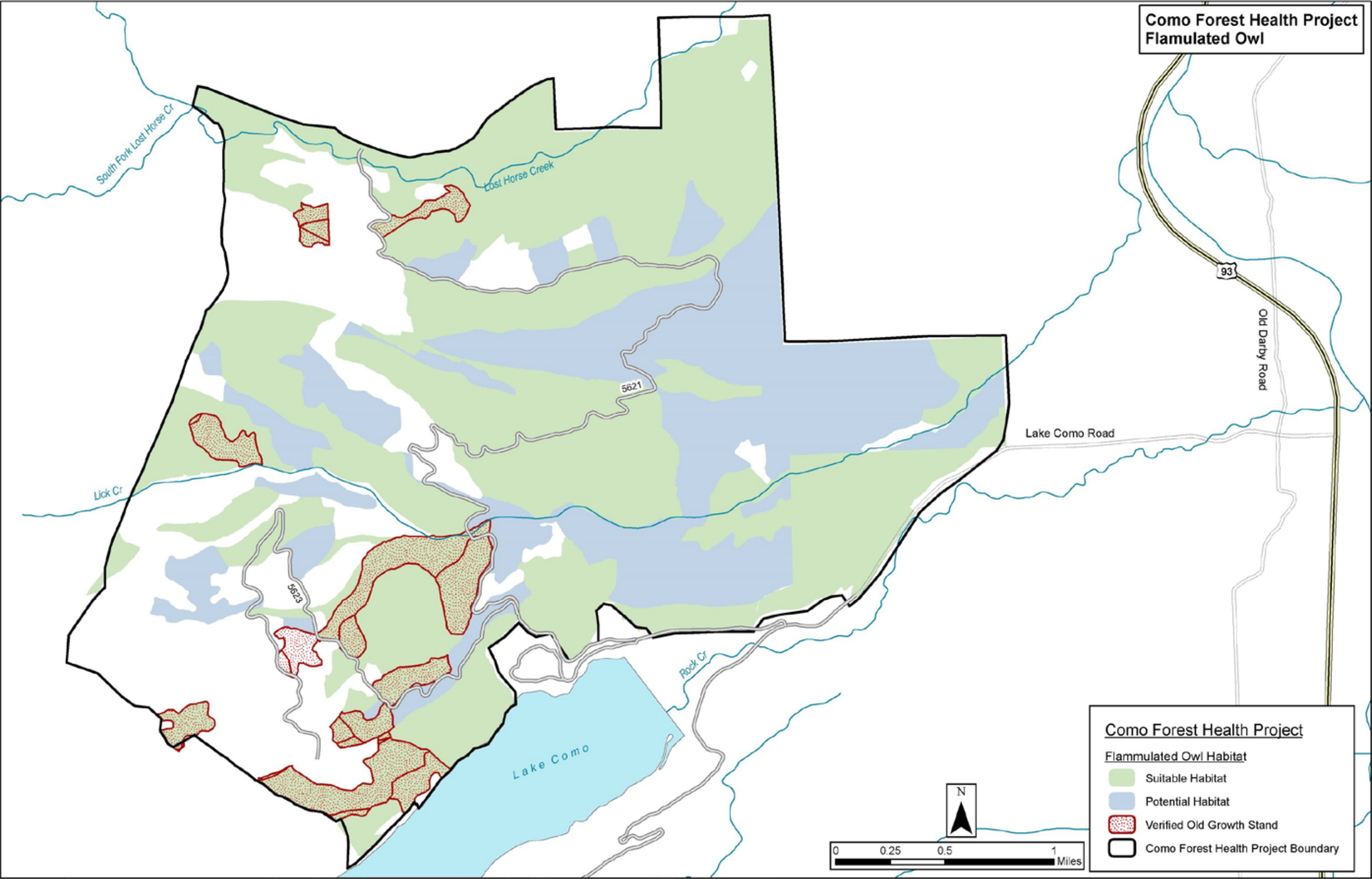


Figure 3.3- 15: Suitable and Potential Flammulated Owl Habitat within the Como Forest Health Project

Threats and Limiting Factors

Flammulated owl populations are apparently most sensitive to variation in adult survival (McCallum 1994) which makes populations vulnerable to environmental perturbations (such as habitat loss, fragmentation, or pesticides) and slow to recover from population declines (McCallum 1994). Since flammulated owls are habitat specialists and are restricted primarily to forest types of commercially valuable tree species, forest management may affect viability (McCallum 1994). Old-growth ponderosa pine is their preferred habitat and has declined in North America during the twentieth century from timber harvesting, firewood cutting, and fire suppression. Flammulated owls are particularly vulnerable to clearcutting and the cutting of mature trees (Spahr et al. 1991) as it often results in the loss of nest cavities.

Flammulated owls are most susceptible to disturbance during peak of breeding season in June and July, and disturbance from logging activity can have a detrimental effect (USDA Forest Service 1994).

Insecticides used to control forest pests may affect the abundance of insect prey. Reynolds and Linkhart (1998) noted that carbaryl is often used to control spruce budworm and may inadvertently reduce non-target insect species, such as the noctuid moths, which the owl heavily depends upon.

Flammulated owls depend on northern flickers (*Colaptes auratus*), pileated woodpeckers (*Dryocopus pileatus*), sapsuckers (*Sphyrapicus* spp.), and other large primary cavity nesters to excavate nest cavities. The loss of these species from a forest community would be disastrous for owls (NatureServe 2014).

Desired Condition

The desired condition for flammulated owls within the Como Forest Health project area is to provide and maintain habitat that supports a viable flammulated owl population and prevents a population decline as described by the regulatory framework.

3.3.7.4 Environmental Consequences

Methodology

For each alternative, the following evaluation criteria were used to predict effects on flammulated owls:

- Stand structure, composition, and density of potential and suitable habitat,
- Snag density of potential and suitable habitat, and
- Temporary disturbance in suitable habitat.

Suitable and potential habitats in the Como Forest Health Project were mapped through a query of the TSMRS/FACTS database. Vegetation and physical data were collected for many of these stands in 2013. Some plot data is older, but still valid.

Suitable habitat was delineated as ponderosa pine or Douglas-fir within habitat type groups A, B, C, and G that is in a more mature seral stage (mature, saw timber, multi-storied or old growth habitat) (PF-WILD-029).

Potential habitat was delineated as ponderosa pine or Douglas-fir within habitat type groups A, B, C, and G that is in a young seral stage (seed, pole, sap).

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for flammulated owls is the whole Como Forest Health project area of 5,711 acres. The project area is appropriate for the analysis because it provides a large area of contiguous suitable or potentially suitable habitat that could support a cluster of flammulated owl territories.

Stringers of continuous, mature forest end at the project boundary on the southern, eastern, and northern sides Lake Como, private land, and Lost Horse drainage border the project area (Fig. 16). To the west, the wilderness and roadless areas connect to the project area and may support populations of flammulated owls, but effects from this project would be immeasurable within this large expanse of unmanaged habitat. Home ranges for flammulated owls can vary up to 59 acres (McCallum 1994), so the project area can theoretically support at least 51 home ranges.

An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 on suitable and potential habitat would last until stands within or around the treatment areas replace snags with cavities for nesting and can be considered suitable flammulated owl habitat.

Disturbance impacts would affect owls during logging and spring burning activities. Fall burning activities would not disturb owls because the young would have fledged.

Broader Context and Trends

The flammulated owl is perhaps the most common raptor of the montane pine forests of the western United States and Mexico (McCallum 1994). The Bitterroot National Forest is near the northeast edge of the known range of this species. As of 1998, flammulated owls were considered to have a widespread presence in Missoula and Ravalli counties (Wright 1996 and MTNHP 2014).

The number of flammulated owl detections on the Bitterroot National Forest on unburned monitoring transects has remained consistent from 2000 to 2010. In high and mixed severity fires that burned through areas known to support concentrations of flammulated owls in 2000, about half the number of flammulated owls were detected in 2001. Flammulated owl detections on burned transects have continued to decline, and we found very few owls in burned areas in 2005 (PF-FPMON-038).

A standardized Regional survey effort in 2005 found that flammulated owls were well-distributed in suitable habitat west of the Continental Divide, but their distribution east of the Divide was limited. On the Bitterroot National Forest, flammulated owls were detected on 14 of the 30 transects, and on 42 of the 281 sample points (Cilimburg 2006). These surveys showed that flammulated owls are well-distributed in suitable habitat on the southern half of the Forest, which was heavily sampled. They were only detected on a few transects on the north half of the Bitterroot National Forest, but this area was not heavily sampled. Wright (1996) found a similar distribution pattern for flammulated owls on the Bitterroot National Forest during fieldwork for her Master's thesis in 1994 and 1995.

The Region 1 Wildlife Ecologist reviewed flammulated owl viability and determined that habitat is well distributed and abundant in the Northern Region, and that short-term viability of the species in the Northern Region is not threatened (Samson 2005). The habitat threshold for a viable population of flammulated owls is 4,695 acres of habitat. At a Forest wide scale, habitat modeling based on FIA data estimates that the Bitterroot National Forest contains 15,839 acres of flammulated owl habitat, which is 11,144 acres more than the amount estimated as necessary to maintain a minimum viable population of 340 individuals (Samson 2005, Samson 2006). The Bitterroot National Forest has about 337% of the habitat necessary to maintain a minimum viable population of flammulated owls.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Previous timber harvest on Bitterroot National Forest lands removed many of the large ponderosa pines and large snags that existed in areas of suitable habitat and changed the characteristics of the stand to flammulated owl habitat that is lower quality. Fire suppression allowed Douglas-fir to encroach flammulated owl habitat both within and outside previous harvest units, resulting in higher density stands with smaller diameter trees that lowered owl habitat quality.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on flammulated owl habitat over the short term. Large ponderosa pine and Douglas-fir killed by bark beetles or root disease would create potential nest trees. These nest trees may not be used unless the open stand conditions needed for foraging are present also. Douglas-fir encroachment would continue, lowering habitat quality because of the loss of owl foraging opportunities. As forest density and fuel loads increase, so would the potential fire severity. A low or moderate severity fire would potentially create abundant potential and suitable habitat for flammulated owls in the future, however a high severity fire would preclude owls from using the area.

As wildfires would generally continue to be suppressed in the Como Forest Health project area, there would be little potential for the development of the more open old growth stands with large diameter ponderosa pine and Douglas-fir that flammulated owls prefer for nesting. This would continue until a large-scale, high severity wildfire occurred. The loss of the large ponderosa pine, through either encroachment or fire, would reduce the availability of potential flammulated owl nesting habitat for a period of more than 100 years.

Cumulative Effects

Along open roads, large snags would continue to be cut by firewood cutters.

Alternative 2, 3, and 4

Design Features and Mitigation Measures

Snag retention design features are incorporated into the alternatives to ensure the maintenance and development of flammulated owl snag habitat (Chapter 2). Monitoring reports and field notes from previous Bitterroot National Forest projects substantiate the effectiveness of these features (Forest Plan Monitoring Report 2008).

Direct and Indirect Effects

Table 3.3- 20 shows the breakdown of proposed treatments within suitable and potential flammulated owl habitat.

Over half of the suitable habitat in the project area would be treated in Alternatives 2 and 3, mostly through commercial treatment (Table 3.3- 20). In Alternative 4, 40% of the suitable habitat would be treated. Flammulated owl habitat outside of the treatment units is mostly in three large patches and would continue to be functional owl habitat (Figure 3.3- 16). All of the alternatives would treat over half of the potential flammulated owl habitat in the project area (Table 3.3- 20). About 370 and 502 acres of potential owl habitat in patchy stringers across the project area would not be treated, respectively (Figure 3.3- 17, Figure 3.3- 18). While the treatment of the potential habitat would not

affect owls directly, it will remove nesting habitat that would have otherwise been available in the future for owls to use.

Table 3.3- 20: Suitable and Potential Flammulated Owl Habitat Treated in Alternatives 2, 3, and 4

TREATMENT	SUITABLE HABITAT (ACRES)			POTENTIAL HABITAT (ACRES)		
	ALT 2	ALT 3	ALT 4	ALT 2	ALT 3	ALT 4
Commercial treatment	729	711	526	621	506	526
Prescribed fire only	681	475	156	202	119	34
Non-commercial thinning	301	578	502	179	244	205
Aspen treatment	NA	NA	30	NA	NA	NA
TOTAL	1712	1764	1214	1002	869	765
Current habitat in the project area	3009	3009	3009	1371	1371	1371
Percentage of treated habitat (%)	57	59	40	73	63	56

The commercial harvest treatments in units with flammulated owl habitat, including research units 22 and 23 in Alternatives 3 and 4, are designed to maintain or improve characteristics that provide habitat for owls. Basal areas would be reduced while large diameter trees will be retained. The canopy would be opened and more grass and forbs would be produced. Snags would be retained according to the snag retention guidelines to ensure nesting habitat would remain in the units.

The prescribed burn units generally contain many large ponderosa pine and large snags that provide components of flammulated owl habitat. However, within the Como Forest Health project area, there are a minimal number of snags in most of the units (See Snag report) and Douglas-fir is filling in the understory of these stands. These conditions threaten to reduce the open spacing and diverse forb and grass community that supports the insect prey base used by flammulated owls. Prescribed fire would kill many of the smaller encroaching Douglas-firs and improve foraging conditions for flammulated owls. However, burning could also reduce the number of large snags that provide potential flammulated owl nesting habitat, because some of these snags would likely catch fire and burn until they fell. Large snags would also be created by fire and could be used for as nesting habitat once woodpeckers created cavities in them. Prescribed burning is thus likely to improve flammulated owl foraging conditions while it decreases the amount of suitable nesting habitat. The net effect of these conflicting habitat impacts is likely to be somewhat negative since nesting habitat may be more limited than foraging habitat.

In Alternative 2, there will be no pre-treatment in burn units A, B, C, H, E, and E2, which will result in more severe fire effects, including greater snag loss and slower grass and forb regeneration. These conditions would further negate the flammulated owl benefits in those units. The small diameter trees in burn units A, B2, C2, would be thinned in Alternatives 3 and 4, and burn unit E2 would also be thinned in Alternative 3. The pre-treatment will improve burning conditions to maintain low severity fire. Low severity fire would benefit flammulated owl habitat by reducing fuel loads, stimulating grass production, and lowering the potential of losing snags in the fire. Burn units B, E, and E2 would not be treated in Alternative 4. The direct impacts of not treating these units will be minimal, but there will be the potential for a higher severity fire if a wildfire occurred.

Old Growth units (3, 4, 5, 6, 10, 45, 46, 47, and E) will be treated and the treatments proposed in several units would move them closer to desired flammulated owl habitat conditions in the long term. Flammulated owl habitat conditions would be improved by increasing the ratio of ponderosa pine in the stands, maintaining growth rates of remaining trees, and moving the units towards the open stand structure that flammulated owls prefer. However, over the short-term, snag density may be reduced in these units if quality snags are removed as logger safety hazards. Removing quality

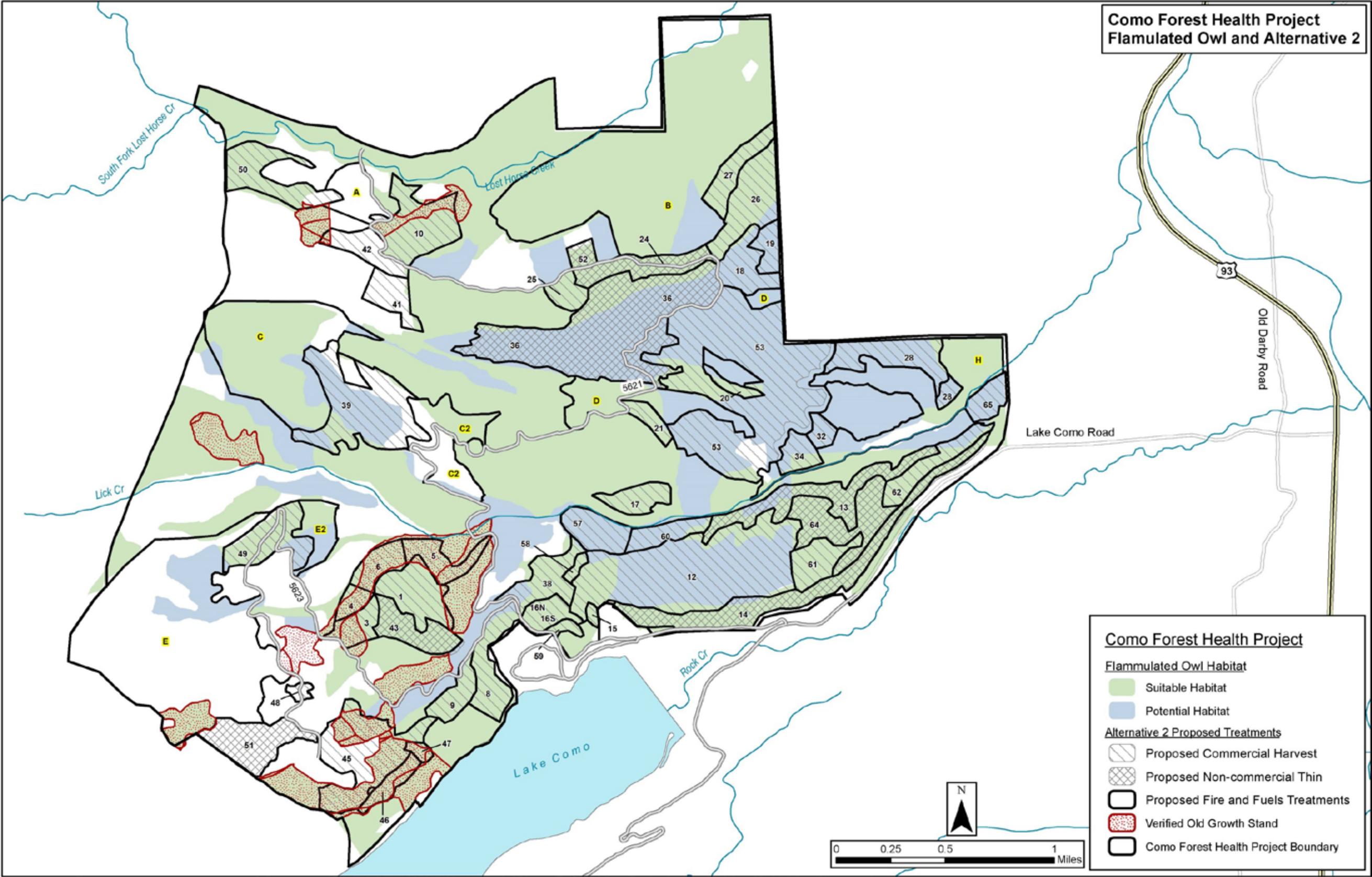


Figure 3.3- 16: Flammulated Owl Habitat and Proposed Treatment Units for Alternative 2

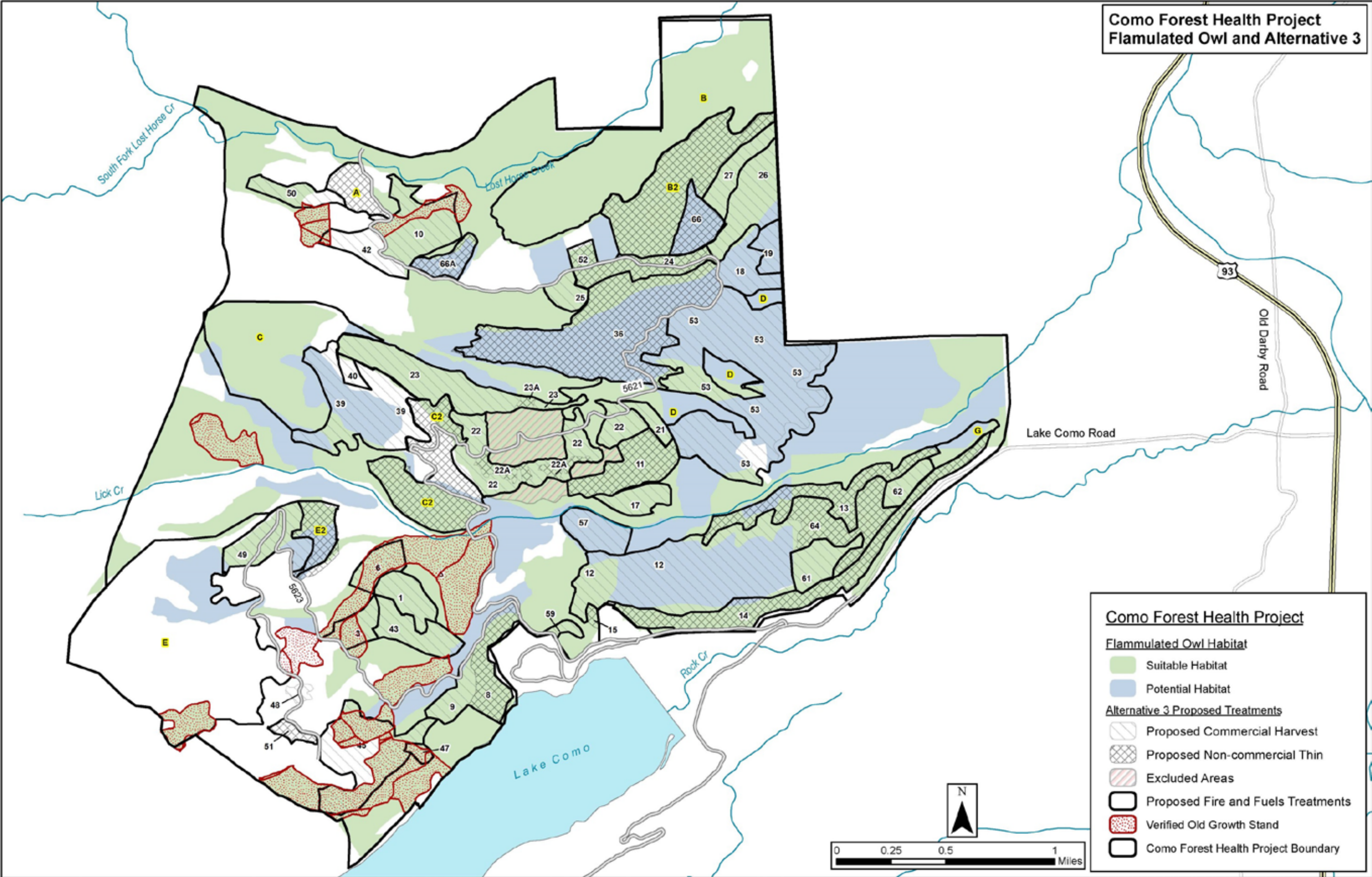


Figure 3.3- 17: Flammulated Owl Habitat and Proposed Treatment Units for Alternative 3

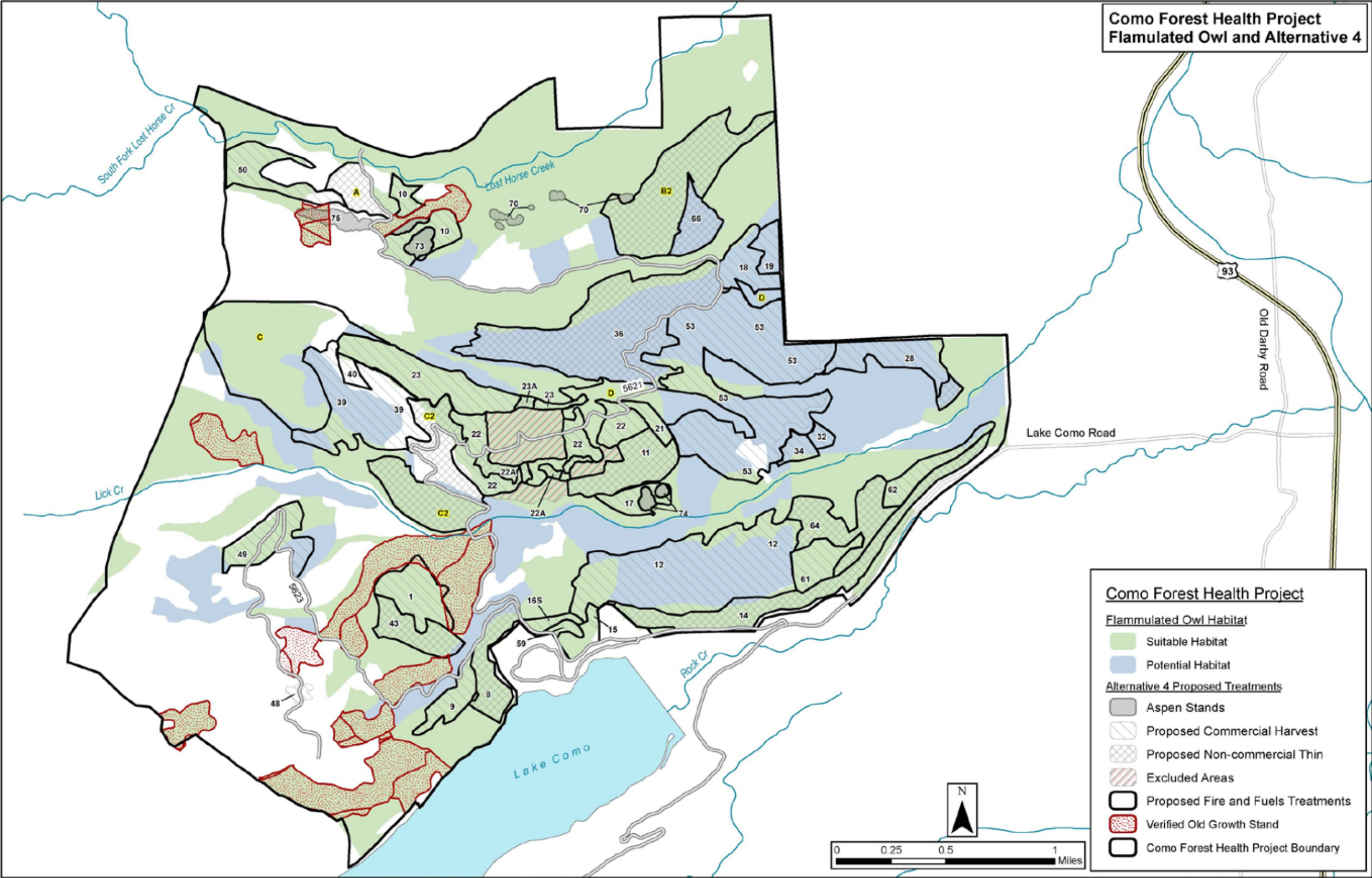


Figure 3.3- 18: Flammulated Owl Habitat and Proposed Treatment Units for Alternative 4

snags reduces the amount of available flammulated owl nesting habitat. Snag retention guidelines would retain snags representative of historical levels for the habitat types so the level of nesting habitat should be retained. In addition, snags outside of treatment units would also provide nesting habitat.

Old Growth units will not be treated in Alternative 4 and will continue to provide flammulated owl habitat. These units would also be at risk for a high severity fire (Old Growth section). Units that are close to reaching old growth status would not be treated, either, and would act as recruitment stands, providing flammulated owl habitat in the future. Flammulated nesting habitat would not change in the old growth units because snags would not be reduced to comply with OSHA standards since logging would not occur.

None of the other treatments in proposed units would affect existing or potential flammulated owl habitat because they do not provide the mature, open ponderosa pine forest composition and structure that is closely associated with this species. All of the proposed units would reduce the risk of a large wildfire in suitable flammulated owl habitat, which would likely eliminate habitat suitability of burned areas.

Disturbance to owls would occur while proposed activities were being implemented. Flammulated owls are most susceptible to disturbance during peak of breeding season in June and July, and disturbance from logging activity can have a detrimental effect (USDA Forest Service 1994). It is most likely that commercial harvest would occur during June and July, which would have a negative effect if owls were within the treatment units during these activities.

Overall, the effects of the treatments in this alternative would be somewhat negative for flammulated owls in the short term and somewhat positive in the long term. In the short-term, potential nesting snags might be reduced but the more open conditions of the mature ponderosa pine stands would improve foraging conditions.

Cumulative Effects

Firewood cutting would continue to reduce snag numbers for about 100 feet from open roads and in dispersed campsites throughout the project area. Combined with snag reduction within the treatment units, there will be a decrease in the availability of flammulated owl nesting habitat.

3.3.7.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. The available flammulated owl habitat on the Bitterroot National Forest and across the region far exceeds the amount needed to maintain a minimum viable population. Available habitat also appears to be well-distributed as mapped by the Montana Natural Heritage Program, Idaho Birdnet, and NatureServe (2014). Alternative 1 would not decrease flammulated owl habitat and therefore, would not likely cause a trend toward federal listing or reduced viability for the population or species. In Alternative 2, 3, and 4, the Como Forest Health project would promote habitat composition and structure suitable for flammulated owls. Therefore, while proposed activities may impact individual flammulated owls or their habitat, effects would be negligible and Alternatives 2, 3, and 4 would not likely result in a trend toward federal listing or reduced viability for the population or species.

Forest Plan

Alternatives 1 and 4 will not reduce the amount of old growth habitat remaining in the project area in the short term, because old growth stands would not be treated. No snags will be removed in the Como Forest Health project area under Alternative 1.

Treatments in Alternatives 2, 3, and 4 are intended to protect mature stands from stand-replacing fires, thus protecting their potential as future old growth habitat. The treatments proposed in stands that do not currently provide old growth habitat would not affect the unit's potential to develop old growth habitat characteristics. In fact, the treatments will improve species composition of the stands, the health and vigor of the remaining trees, increase growth rates, and reduce risk of losing the stands from stand replacing crown fires, insects and disease. Alternatives 2 and 3 have the potential to reduce the amount of old growth habitat in the project area over the next 50 years, but the treatments would maintain them over the long term.

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of snags that do not present an unacceptable safety risk. However, almost all snags in harvest units can be considered safety risks so few snags are being left. To compensate for this, design features provide guidance for the appropriate number of snags required for the site and large diameter trees remaining after harvest serve as snag replacements and vertical diversity for sensitive species habitat. Project design features will provide this guidance and have been effective in previous projects (PF-WILD-028). Alternatives 1, 2, 3, and 4 would comply with the forest plan standard for snag densities.

3.3.7.6 Summary of Effects

Implementation of Alternative 1 would have no impact on the flammulated owls or their habitat.

Implementation of Alternatives 2, 3, and 4 **may impact individual flammulated owls or their habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to population or species** (Section 3.3.14).

3.3.8 Gray Wolf (*Canis lupus*)

3.3.8.1 Overview of Issues Addressed

Habitat Quantity and Quality

Gray wolves are classified as habitat generalists, and as such, they can be found in a variety of habitats including grasslands, dense forests, and semideserts. They are limited only by the availability of their prey, which on the Bitterroot National Forest typically includes deer (*Odocoileus* spp.), elk (*Cervus elaphus*), moose (*Alces alces*), and bighorn sheep (*Ovis canadensis*). The size of a territory for a wolf pack largely depends on prey density in the area and the age of the pups in the pack. Territories become larger as prey becomes less available and when pups get older and start having the same nutritional needs as adults (Jedrzejewski et al. 2007; Mech & Boitani 2003). The average size of a core territory, or the area where the pack spends 50% of their time, is approximately 35 km² (14 mi²) (Jedrzejewski, et al. 2007).

Because of the reliance of wolves on prey populations, the quality of big game habitat is important to the growth and persistence of wolves on a landscape. The entire Como Forest Health project area is considered suitable habitat for wolves, because areas identified as big game winter range are of particular importance to them.

Issue Indicators

Because wolves are habitat generalists, habitat quality is not used as an evaluation criterion to predict effects of project activities. Limiting factors for wolves include the availability of their prey and mortality from human interactions (particularly hunting and trapping). For each alternative, the following evaluation criteria are used to predict impacts to gray wolves:

- “ Prey availability (elk)
- “ Human disturbance as measured by open road density.

Prey availability will be measured through impacts on elk within and around the project area (see section on Elk for full analysis). Human disturbance will be measured through changes in open road density throughout the analysis area.

3.3.8.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing gray wolves comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

3.3.8.3 Affected Environment

Existing Condition

Legal and Management Status

After spending over 35 years on the Endangered Species List, gray wolves in the northern Rocky Mountains have been removed from federal protection. The Northern Region, Regional Forester lists gray wolves as sensitive species. Montana and Idaho held wolf hunting seasons in 2009, 2011, 2012 and 2013; both states held wolf trapping seasons in 2012 and 2013.

On April 15, 2011, the President signed the 2011 Appropriations Act, which included the following statement:

“Before the end of the 60-day period beginning on the date of enactment of this division, the Secretary of the Interior shall reissue the final rule published on April 2, 2009 (74 Fed. Reg. 15123 et seq.) without regard to any other provision of statute or regulation that applies to issuance of such rule. Such reissuance (including this section) shall not be subject to judicial review and shall not abrogate or otherwise have any effect on the Order and Judgment issued by the United States District Court for the District of Wyoming in Case Numbers 09-CV-118J and 09-CV-138J on November 18, 2010.”

As a result of this legislation, the United States Fish and Wildlife Service (USFWS) reissued the 2009 wolf delisting rule on May 5, 2011 (PF-WILD-013). Consequently, wolves in Montana and Idaho were no longer listed as Endangered, and wolf management was returned to the state wildlife management agencies. According to the provisions of the 2011 Appropriations Act, this reissuance is not subject to judicial review. Wolves were automatically added to the Regional Forester’s Sensitive species list at the time they were delisted.

Local Habitat Status

Wolves are classified as habitat generalists and thrive in diverse landscapes. The entire project area is currently suitable habitat for wolves.

Local Population Status and Trends

When wolf recovery in the northern Rocky Mountains began in the early 1980s, three federal recovery areas were designated across Idaho, Montana, and Wyoming: the Northwest Montana

Recovery Area, the Greater Yellowstone Experimental Population Area, and the Central Idaho Experimental Population Area (Bradley et al. 2013). The entire Bitterroot National Forest is part of the Central Idaho Experimental Population Area (CID) and most wolves on the Bitterroot National Forest are probably the descendants of wolves reintroduced into central Idaho in 1995.

Wolf range and numbers within Montana in 2012 decreased four percent from 2011 levels, partly due to the ability to hold legal wolf hunting and trapping seasons in 2011, but there was an increase in the number of packs (Bradley et al. 2013). Pack numbers have steadily increased since the minimum count of 46 in 2005. Wolf monitoring efforts conducted by the MTFWP, the Idaho Fish and Game, and the Nez Perce Tribe documented a total of 147 wolf packs, 37 packs qualified as breeding pairs, and a minimum count of 625 wolves in Montana at the end of 2012.

Monitoring efforts in 2012 documented a total of 23 packs, 4 packs qualified as breeding pairs, and a minimum of 93 wolves in the Montana portion of the CID. This is a decrease from the 2011 estimated of 147 wolves but the number of packs remained stable (Bradley et al. 2013). Reproduction was confirmed in 12 packs within the CID, stable from 2011 reproduction observations.

Documented total wolf mortality in 2012 was higher than in 2011. Mortalities in 2012 included 175 public harvests versus 121 harvests in 2011. There were more lethal control removals in 2012 (108) than in 2011 (64), but fewer than in 2010 (141). Within the Montana portion of the CID, 59 wolf mortalities were documented in 2012, up from 51 in 2011. Thirty wolves were harvested legally during the 2012 hunting season in the Montana portion of the CID, up from 19 in 2011.

Twelve wolf packs were known to use portions of the Forest in 2012 and additional packs and pairs are suspected to use areas of the forest throughout the year although they denned in Idaho (Bradley et al. 2012; Idaho Fish and Game and Nez Perce Tribe 2012). Reproduction was confirmed in seven packs on the Bitterroot National Forest in 2012, and two dispersals were documented from Bitterroot packs during the same time.

The Como Forest Health project area is within the former territory of the Lake Como Pack. The pack consisted of three wolves (two adults and one sub-adult) and in 2011, the pack was lethally removed following a depredation incident which occurred on a local ranch. Currently, the Como territory is not occupied year-round by a single pack, but is most likely used during winter months by the Trapper Peak pack (PF-WILD-014).

The Trapper Peak pack is a small pack of wolves, consisting of the breeding pair, one sub-adult and pups born in 2013. The pack holds a territory in the Bitterroot Mountains south of Darby, extending into McCoy Creek to the South and most likely Roaring Lion Creek to the North, including the Como Forest Health project area. Solitary or dispersing wolves most likely use the area as well, however there are no known individuals currently occupying the project area. Montana Natural Heritage Tracker shows 19 separate observations of gray wolves in the vicinity of the Como Forest Health project area from January 2002 through January 2012 (Table 3.3- 21).

Threats and Limiting Factors

Throughout their global range, wolves have been exterminated from large areas through trapping, shooting, poisoning, and reduction in prey populations (ungulate herds). Populations of wolves can be threatened by direct human-caused mortality or habitat loss (NatureServe 2014). The USFWS (2014) state wolves "only require ungulate prey and human-caused mortality rates that are not excessive" as life history requirements.

Wolves were not present on the Bitterroot National Forest during much of the past period of timber harvest because statewide bounties were placed on gray wolves that significantly reduced the

populations. From 1883 to 1915, approximately 80,730 wolves were killed in Montana through bounty programs (Barker 1993, pg 178). These programs are no longer in place, and it is thought that threats to the northern Rocky Mountain population have been sufficiently reduced or eliminated as evidenced by the population exceeding the numerical, distributional, and temporal recovery goals each year since 2002 (USFWS 2006).

Table 3.3- 21: Observation Details of Gray Wolves within the Vicinity of the Como Forest Health Project Area from MT Natural Heritage Program (2014).

COMMON NAME	OBSERVATION DATE	COUNTY	ELEVATION (FEET)	LOCATION COMMENTS
Gray Wolf	1-Jan-10	Ravalli	6959	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	1-Jan-10	Ravalli	5574	FWP wolf monitoring database, pack name: Trapper Peak
Gray Wolf	1-Jan-10	Ravalli	5407	FWP wolf monitoring database, pack name: Divide Cr
Gray Wolf	1-Jan-09	Ravalli	6142	FWP wolf monitoring database, pack name: Divide Crk
Gray Wolf	1-Jan-09	Ravalli	6906	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	1-Jan-09	Ravalli	5814	FWP wolf monitoring database, pack name: Trapper Pk
Gray Wolf	1-Jan-08	Ravalli	6959	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	1-Jan-08	Ravalli	5151	FWP wolf monitoring database, pack name: Trapper Peak
Gray Wolf	1-Jan-08	Ravalli	6322	FWP wolf monitoring database, pack name: Divide Crk
Gray Wolf	1-Jan-07	Ravalli	6959	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	1-Jan-07	Ravalli	5781	FWP wolf monitoring database, pack name: Trapper Peak
Gray Wolf	1-Jan-07	Ravalli	6460	FWP wolf monitoring database, pack name: Divide Creek
Gray Wolf	1-Jan-06	Ravalli	6804	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	1-Jan-06	Ravalli	5850	FWP wolf monitoring database, pack name: Divide Creek
Gray Wolf	1-Jan-06	Ravalli	6539	FWP wolf monitoring database, pack name: Skalkaho
Gray Wolf	1-Jan-05	Ravalli	5732	FWP wolf monitoring database, pack name: Skalkaho
Gray Wolf	1-Jan-05	Ravalli	6811	FWP wolf monitoring database, pack name: Lake Como
Gray Wolf	21-Jan-04	Ravalli	6079	Twelvemile Creek
Gray Wolf	1-Jan-02	Ravalli	6965	FWP wolf monitoring database, pack name: Lake Como

Desired Condition

The desired condition for gray wolves within the Como Forest Health project area is to provide habitat to support a viable population of wolves and maintain habitat for the continued recovery of the northern Rocky Mountain gray wolf population as described in the regulatory framework.

3.3.8.4 Environmental Consequences

Methodology

For each alternative, the following evaluation criteria are used to predict impacts on gray wolf:

- Prey availability (elk)
- Human disturbance as predicted by open road density.

Because wolves are habitat generalists and none of the activities proposed would make habitat unsuitable for wolves, habitat quality is not an evaluation criteria. Prey availability will be measured through impacts to elk within and around the project area (see section on Elk for full analysis). Human disturbance will be measured through changes in open road density throughout the project area.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for wolves is the Bitterroot Mountains, extending from McCoy Creek to Lolo Creek, representing the territory of the Trapper Peak pack and known dispersing individuals who use the project area and Hunting District 240, which is the management unit for the wolves' prey base (deer and elk). This analysis area is appropriate to analyze any incremental effects from the actions of this project on wolves directly, indirectly or in conjunction with past, present, ongoing and reasonable foreseeable actions because the impacts caused by the proposed activities will be localized to any roads being opened, increases in access and decreases in prey populations within the project area. Incremental effects of proposed activities of this project on wolf populations outside of this effects area would not be measurable. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would last while the management activities were occurring. Given the large territories of wolves and the high mobility of wolves and their prey, cumulative effects would be minimal and temporary in nature.

Broader Context and Trends

MTFWP classifies the gray wolf as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the gray wolf as a G4S4 species (MDFWP 2014). This means that at the global scale, wolves are considered to be uncommon but not rare (although they may be rare in parts of their range), and usually widespread. They are apparently not vulnerable in most of their range, but there is possibly cause for long-term concern. At the state scale, they are considered to be apparently secure, though they may be quite rare in parts of their range, and/or suspected to be declining.

As stated above, wolves were not present on the Forest, or in Montana, from the 1930s through the 1990s due to statewide bounty programs. Naturally dispersing wolves from Canada first denned along the west side of Glacier National Park in 1986, and wolves became established throughout much of northwest Montana in the following decade. Wolves were reintroduced into central Idaho and Yellowstone National Park in 1995 and 1996, respectively, and populations in southern Idaho and southwestern Montana have increased and expanded their ranges since then. Most wolves on the Bitterroot National Forest are probably descendants of wolves released in central Idaho.

The Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho Final Environmental Impact Statement (USDI Fish and Wildlife Service 1994) shows the entire Bitterroot National Forest within the boundaries of the Central Idaho Non-essential Experimental Population Area. A non-essential experimental population is defined as an introduced population, not essential to survival of the gray wolf in the wild. The Selected Alternative, for which the ROD was signed in early July 1994, describes the reintroduction and recovery process for the Central Idaho area in great detail. Wolves were moved from Canada to the Central Idaho area at three locations: the mouth of Corn Creek on the Salmon River and at Indian Creek and Thomas Creek airstrips on the Middle Fork of the Salmon River in January and December, 1995. The Fish and Wildlife Service, through the Nez Perce Tribe and the state wildlife agencies, continues to monitor their movements and populations.

Under the conditions for management of the non-essential experimental population published in the Federal Register November 22, 1994, the only land management restriction in the recovery area would be to:

"...control intrusive human disturbances around active wolf den sites. Such temporary restrictions on human access, when five or fewer breeding pairs are

established in an experimental area, may be required between April 1 and June 30, within one mile of active wolf dens or rendezvous sites and would only apply to public lands.... When six or more breeding pairs are established in an experimental population area, no land-use restrictions may be employed outside of national parks or national wildlife refuges..." (USDI Fish and Wildlife Service 1994).

We have no evidence that gray wolves occurred in the project area in decades prior to the U.S. Fish and Wildlife Service's reintroduction efforts near the Salmon River in January 1995. Confirmed reports of wolf tracks, scat, howling, and wolf sightings have become common across the Forest since that time, and wolf packs have been verified occupying territories in Montana, Idaho, Wyoming, Washington, and Oregon (Figure 3.3- 19).

According to the USFWS, the most recent data available (end of 2012) indicates that the northern Rocky Mountain wolf population contains at least 1,674 adult wolves, at least 321 confirmed packs, and at least 103 breeding pairs. This population has exceeded its recovery goals for 11 consecutive years (Figure 3.3-20). Thus, this population is delisted and is being managed successfully and responsibly by the states.

Over the long-term, the USFWS expects the entire northern Rocky Mountain population to maintain a long-term average of around 1,000 wolves. These wolves represent a 400-mile southern range extension of a vast contiguous wolf population that numbers over 12,000 wolves in western Canada and about 65,000 wolves across all of Canada and Alaska. The USFWS and its partners will monitor wolves in the region until at least 2016 (5 years after delisting) to ensure that the population's recovered status is not compromised, and if relisting is ever warranted, the USFWS can use the ESA emergency listing provisions.

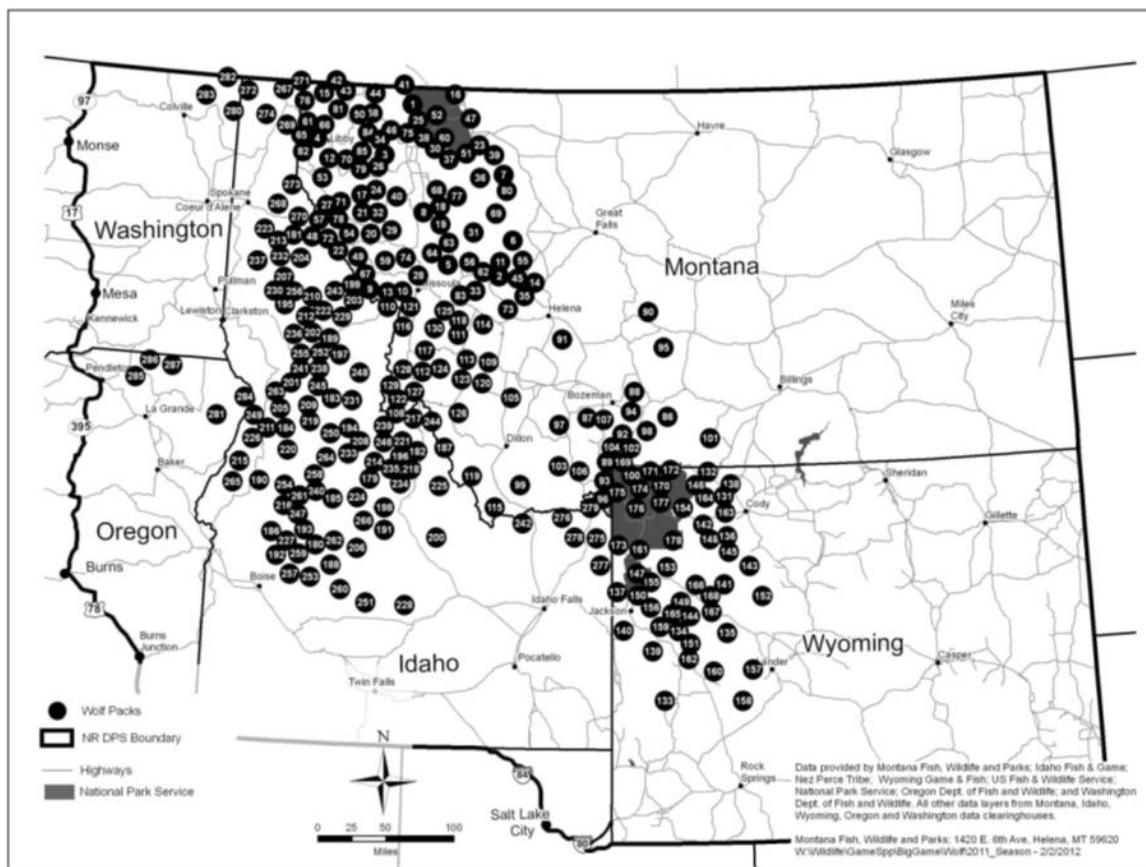


Figure 3.3- 19: Northern Rocky Mountain Gray Wolf Distinct Population Segment Area.

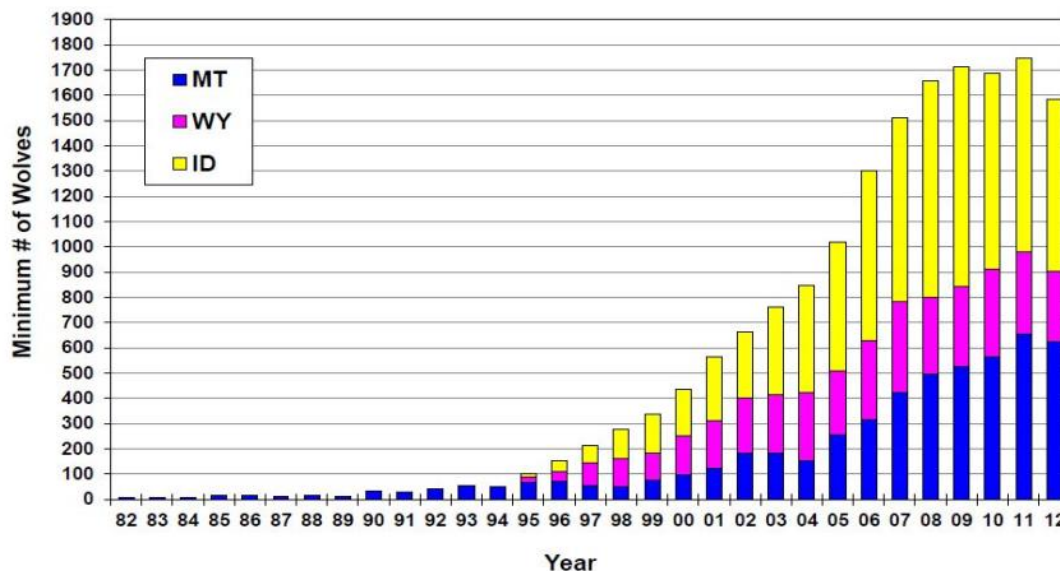


Figure 3.3- 20: Northern Rocky Mountain Wolf Population Trends in Montana, Idaho, and Wyoming: 1982-2012

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Wolves were not present in the Bitterroot Mountains during previous periods of extensive road construction and timber harvest, so these activities had no direct or indirect effects on wolves. Clearcutting and improved hunting access to the area on the road system constructed for access to timber harvest units resulted in declines in elk populations documented in the elk section. However, elk populations had rebounded by the time wolves reoccupied the Bitterroot Mountains due to road closures and reforestation that increased hiding cover. The fact that wolves have reoccupied the area recently and are reproducing successfully indicates that the area is providing suitable habitat for wolves.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative. The No Action alternative would not affect gray wolf habitat or populations in the short term. This alternative would not affect the wolf prey availability because it would not change existing habitat conditions. The potential for human disturbance would not change because open road densities would not change.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on wolf populations or suitable habitat because it does not change open road densities or implement any vegetation management activities. Prey populations (elk and deer) may eventually decline to some extent due to habitat changes from natural forces such as vegetation succession, beetle infestation, and wildfires (see elk section), but this change would occur at a natural rate that would allow wolves to adapt to new prey sources.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore, there are no cumulative effects.

Alternative 2, 3, and 4

Direct and Indirect Effects

Vegetation treatments proposed in these alternatives could result in minor changes to population numbers of deer and elk in the project area because they would result in increased forage production and reduced thermal and hiding cover (See elk report). There are no proposed changes in open road densities in the project area that would change the potential for human disturbance to wolves and their prey in those areas; however, the potential for illegal off-road use will increase. The net effect from this combination of factors to local wolf populations is expected to be negligible. Human disturbance might temporarily displaced individual wolves and cause them to move to another portion of their large territory.

Cumulative Effects

There would be no cumulative effects on wolves or their habitat because the direct and indirect effects are minor and no known effects of past, present, or foreseeable actions that would combine with them and create a larger effect.

3.3.8.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would comply with NFMA direction to maintain wolf populations distributed across the planning area. At the end of 2012, there was a minimum of 23 wolf packs and 93 wolves within the Montana portion of the CID. The Bitterroot National Forest had at least 12 wolf packs centrally using the Forest, with 7 of those packs reproducing in 2012. While other factors outside of the Forest Service's control (illegal mortality, competing predator populations, global warming) may affect gray wolf populations, actions proposed in Alternatives 2, 3, and 4 are compatible with conserving gray wolves to a non-listed status and consistent with maintaining habitat for viable populations at the regional and local scales through the retention of big game forage and cover.

Forest Plan

Alternatives 1, 2, 3, and 4 will maintain wolf populations and habitat. Protection of this species was considered during the analysis and the alternatives comply with requirements in the Bitterroot National Forest Plan.

3.3.8.6 Summary of Effects

Implementation of Alternatives 1, 2, 3, and 4 would have no impact on gray wolves or their habitat (Section 3.3.14)

3.3.9 Western Toad (*Bufo boreas*)

3.3.9.1 Affected Environment

Existing Condition

Legal and Management Status

The Forest Service Regional Forester for the Northern Region currently lists western toads as a sensitive species.

Montana Fish, Wildlife, and Parks (MTFWP) classifies the western toad as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the western toad as a G4 S2 species (MTFWP 2014). Range wide, this means that the species is considered uncommon, but not

rare (although it may be rare in parts of its range), and usually widespread. On the state scale, the species is at risk because of very limited and potentially declining numbers, range or habitat, making it vulnerable to extirpation in the state.

Local Habitat Status

Breeding Habitat

Western toads are habitat generalists that are found in a variety of habitats from valley bottoms to high elevations. They breed in lakes, ponds, and slow streams with a preference for shallow areas with mud bottoms. Tadpoles are seen in ponds during the day. Breeding sites in lakes and ponds are critical for western toads, but there is little indication that outside of the late spring/early summer breeding season riparian habitats are particularly important and the species is considered "largely terrestrial" (Nessbaum et al. 1983). However, western toads do occur and will sometimes travel along the edges of rivers and streams (Carpenter 1954; Olson et al. 1997; Robinson et al. 1998; Adams et al. 2005).

There are no known breeding sites located directly within the Como Forest Health project area, but there are four breeding sites located directly outside of the project boundaries that were identified by Maxell (2004) (Table 3.3- 22).

Table 3.3- 22: Western Toad Breeding activity around Como Forest Health Project area, from Maxell (2004).

SITE ID	LOCALITY	DETECTION HISTORY
15402001	Kramis Pond, 250 meters N of NE corner of Lake Como	1. On 19 May 1995 Paul Hendricks detected 4 adults calling and 17 juveniles and on 16 June 1995 he detected 7 larvae and collected 1 as a museum voucher specimen. 2. On 24 June 1999 I detected 100+ larvae and one adult. 3. On 27 June 2000 my inventory crew searched the site and did not detect any B. boreas life history stages. 4. On 29 May 2001 my inventory crew detected 11 adults in a breeding aggregation. 5. On 20 June 2002 my inventory crew detected 11+ larvae, 4 juveniles, and 4 adults. 6. On 5 June 2003 my inventory crew detected 2 adult females and on 8 July 2003 they detected <100 larvae and 10 juveniles.
15402004	Lake Como	1. On 27 June 2000 my inventory crew searched the site and did not detect any B. boreas life history stages. 2. On 31 May 2001 I detected 1 adult dead under a rock near the NE shoreline. It had apparently been crushed while taking refuge under the rock. 3. On 31 July 2002 I detected 1000+ larvae on the NE shoreline approximately 100 meters W of the swimming beach. 4. On 8 July 2003 my inventory crew searched the site and did not detect any B.boreas life history stages.
15402005	Ephemeral pool, 0.57 miles NNW of Lake Como spillway	1. On 5 June 2003 my inventory crew detected <100 larvae.
15402006	Ephemeral pool, 0.62 miles NNW of Lake Como spillway	1. On 5 June 2003 my inventory crew detected <100 larvae.

In addition to the known breeding sites, there are eight wetlands with seasonal standing water within the project area (Hydrology section). At least two of these wet areas contain shallow water with muddy bottoms, which have the potential to be used by western toads for breeding. Very small

ponds may occur in association with springs at the heads of some drainages within the project area, and if present, they could provide suitable toad breeding sites. Perennially wet wheel ruts on closed roads may also provide small ponds that could also be suitable for toad breeding habitat.

Lick Creek and Lost Horse Creek drainages are the two major riparian corridors in the project area, which provide habitat for western toads as they migrate through their home ranges. Several smaller tributaries associated with these two large drainages also provide riparian habitat in the project area (Hydrology section).

Terrestrial Habitat

Western toads are considered “largely terrestrial” except during the breeding season (Nussbaum et al. 1983). In one recent study in northeastern Oregon, toads used vegetation types, areas of burning and harvest activities, and a variety of slope steepness in proportion to their availability on the landscape (Bull 2006). However, toads selected south-facing slopes and avoided north-facing slopes compared to random plots. Toads used areas with no trees and seedlings more, and used older stands less than expected based on availability. They also occurred in openings >15 meters in diameter more than expected based on availability (Ibid). In another recent study in southeastern Idaho, western toads selected open forests and sapling stands over either closed forests or recent clearcuts, and selected areas close to patch edges. They also selected habitats with more protective cover, such as shrubs, logs, or rodent burrows (Bartlett et al. 2004).

Several recent studies used radio telemetry to track the movements of radio-marked toads through the active season. In the largest of these studies, Bull (2006) found that the majority of western toads in her five study sites in eastern Oregon left their breeding ponds and traveled in a relatively straight line from the breeding site to small, mostly upland home ranges where they remained for the rest of the summer. Females in this study traveled significantly farther from the breeding site (mean = 2543 meters, n = 27) than males (mean = 997 m, n = 28). Toad locations during the summer were closer to water compared to random plots, although the mean distance of toad locations to water was 46 meters. Males tended to stay closer to water than females.

Adult toads may also migrate to over wintering sites which may be chambers associated with streams or spring seeps or more commonly, rodent burrows deep enough to prevent freezing and having soil moisture high enough to prevent desiccation (PF-WILD-008).

The entire Como Forest Health project area provides suitable habitat for western toads given their use of a variety of habitats, although use may be limited in many of the denser stands on north-facing slopes (Bull 2006).

Local Population Status and Trends

Western toads have been detected in the Bitterroot drainage dating back to 1939 (see cumulative effects section). Western toads have not been documented exactly within the project area; however, there are several records of western toads found immediately outside of the project area boundaries (Table 3.3- 22). Amphibian surveys detected western toads in the Rock Creek (Lake Como) watershed in 2000, 2001, 2002, and 2003, and detected breeding populations in that watershed in 2001, 2002, and 2003 (Maxell 2004). Surveys have not been done since then.

Threats and Limiting Factors

The extent of threats range-wide is not known with certainty, but there appear to be multiple causes contributing to the range-wide trend (NatureServe 2014). Diseases and parasites appear to be contributing factors leading to population declines and malformations (Johnson et al. 2001, 2002; NatureServe 2014). Other declines may be related, at least in part, to habitat destruction and degradation, water retention projects, temperature stress (Corn and Muths 2002), predation by and

competition with native and non-native species especially common ravens in some areas (Olson 1992; Hammerson 1999), fishery management activities (Blaustein et al. 1994; Kiesecker and Blaustein 1997; Kiesecker et al. 2001), or other factors (NatureServe 2014). In Idaho, several hundred toadlets were trampled when domestic sheep were herded through the dried breeding pond (Bartelt 1998).

Within the Como Forest Health project area, grazing and recreational activities present the greatest level of threat to western toad populations. The breeding areas adjacent to the project area are in areas that receive a large amount of recreational use. Road mortality and children collecting/playing with tadpoles in nearby swimming areas present the greatest threat (Maxwell 2004). Because of their occurrence in terrestrial habitats, individual western toads may be injured or killed by vehicles when crossing roads or trails, or by logging equipment operating in harvest units. The potential for direct mortality to toads from motor vehicles is related to the number of miles of roads and trails that are open to motorized use, since toads are largely terrestrial and use a variety of habitats that are often a considerable distance from water. Additionally, the trampling of metamorphs by cattle is also a contributing threat in the Como area if the timing of metamorphosis and the presence of cattle coincide.

Desired Condition

The desired condition for western toads within the Como Forest Health project area is to provide habitat that supports a viable population of toads and maintain habitat that prevents a decline in the western toad population.

3.3.9.2 Environmental Consequences

Methodology

For each alternative, the following evaluation criterion was used to predict impacts to western toads:

- “ Changes in riparian habitat, and
- “ Potential for direct and indirect mortality in terrestrial habitats.

Design Features

Design features to protect riparian habitat are the same for Alternatives 2, 3, and 4. They are explained in the Fisheries section and a complete list of design features is provided in Chapter 2.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for western toads is the Como Forest Health Project area with an additional 2.4 km buffer around the boundary area (PF-WILD-059). This analysis area is appropriate to analyze effects of this project on western toad in conjunction with past, present, and reasonably foreseeable future actions because western toad movements and home ranges for adult toads can range up to 2.4 km (PF-WILD-053). Anything within this buffered area will encompass the range of a toad within the project area. Incremental effects of proposed activities of this project on toads outside the analysis area would not be measurable. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would continue until any altered riparian habitat recovered to a functioning stage, or until the additional traffic from the proposed management activities returns to pre-project levels. The impacts from additional traffic will be short in duration and last while the project is implemented; the loss of canopy cover and coarse woody debris from alterations to any riparian habitat could potentially last up to 10 years.

Broader Context and Trends

Populations of western toads have declined in many parts of their range, including the central Rocky Mountains, California's Central Valley, northern Utah, and the northern Great Basin. Some of these declines have been associated with fungal and bacterial infections, but reasons for others are unknown (Bull 2006). Declines in national parks and wilderness areas, however, indicate that direct anthropogenic influences are not likely causing the decline (PF-WILD-010). Possible causes include: acid precipitation, UV light and a fungus. *Batrachochytrium dendrobatidis* - a pathogenic Chytrid fungus - has been found in western toads collected at the National Elk Refuge near Jackson Hole, Wyoming, and in 26 of 68 tissue samples from four different amphibian species at a number of sites scattered across Montana since 1998 (Maxell 2004).

Until the late 1990s, many biologists believed that populations of western toads in the northern Rocky Mountains had not undergone declines similar to the ones seen in the southern Rockies during the 1970s and 1980s (Maxell 2000). However, surveys in the late 1990s revealed that toads were absent from a large number of their historic localities and that although they were still widespread across the landscape, they occupied an extremely small proportion of suitable habitat (less than 10% in most cases, but usually less than 5%) (Werner and Reichel 1994, 1995; Reichel 1995, 1996, 1997; Koch and Peterson 1995; Koch et al. 1996; Hendricks and Reichel 1996; Werner et al. 1998; reviewed by Maxell et al. 1998). As a result of these findings, the Forest Service listed the boreal toad as a sensitive species in all Region 1 Forests (USDAFS 1999) and initiated a regional inventory program across western Montana during the summer of 2000 which found toads to be widespread, but extremely rare. Of the 40 watersheds that were surveyed, toads were found in 11 (27%), and of the 33 watersheds that contained suitable breeding habitat they were found breeding (eggs, larvae, or metamorphs observed) in 7 (21%). Of the 347 standing water bodies that were surveyed within these watersheds, toads were only found at 13 (3.7%), and were found breeding at only 9 (2.6%).

Maxell (2004, p. 7) reported that western toads were still widespread on the Bitterroot National Forest (detected in 50% of watersheds and breeding detected in 17% of watersheds). Of the lentic (still water) sites surveyed, western toads were detected at 5.5% of wet lentic sites and were breeding at only 2.8% of the wet lentic sites (Maxell 2004). Since 1939, there has been evidence for breeding reported at 16 lentic sites on the Bitterroot National Forest. Monitoring of water bodies at and near these localities was initiated in 2001. Thirteen of these localities were found to have breeding activity in 2001-2003, one site had been destroyed, and two seemed unlikely to ever support breeding activity. Several of the 13 localities with breeding activity are in close proximity to one another. Thus, only eight clusters of breeding activity are currently known in the Bitterroot. One of these occurs within the Como Forest Health Project area.

Incomplete and Unavailable Information

There is a lot of incomplete locational information surrounding the western toad range-wide. Precise locations of breeding sites are needed for long term monitoring (NatureServe 2014). For this project, finer scale locations indicating presence within the project area would be beneficial.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Timber harvest opened up the forest structure within harvest units to various degrees, which may have improved habitat conditions for toads. However, logging activities and the roads built to facilitate access to harvest units increased the risk of direct mortality to toads due to being run over by equipment or vehicles.

The Lake Como Recreation Area and Lost Horse Travel Corridor sustain heavy developed recreational use at the swimming and picnic beaches, campgrounds and boat launch throughout the summer months. Traffic and children playing with or collecting tadpoles also increase the risk of direct mortality to toads due to being run over by vehicles or rough handling and collection.

Grazing activities throughout the analysis area appears to have heavily impacted breeding sites from a structural standpoint. These impacts may have actually benefited western toads by opening up vegetation, but the trampling of metamorphs may have threatened survival of metamorphs depending on the timing of the grazing.

Wildfire management in the past and in the foreseeable future has had and will continue to have an impact on toad habitat. Recent evidence from Glacier National Park has linked western toads with wildfire. Some researchers are investigating whether forest encroachment into meadows, facilitated by fire suppression and cessation of cattle grazing, reduced the suitability of former breeding sites of a species of frog (PF-WILD-055). The relationship between forest structure and western toad habitat is not understood well enough to predict how the changes in forest structure, mimicking natural densities and species composition, would influence western toads.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative. The No Action alternative would not affect western toad habitat or populations in the short term. This alternative would not affect the availability of breeding sites or terrestrial habitat for western toads because it would not change existing habitat conditions.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on breeding sites availability or quality over the short term. The vegetation within the project area would continue to change with natural forces determining stand conditions at a rate that would allow western toads to adapt to changes at a natural, unnoticeable rate.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore, there are no cumulative effects.

Effects of Alternatives 2, 3, and 4

Direct and Indirect Effects

The Como Forest Health project alternatives would have the same effects on western toads though they may vary by minor degrees (Table 3.3- 23). Western toads are vulnerable to changes in both terrestrial and aquatic habitat. Riparian buffers along all known streams, riparian areas, and wetlands would protect any toad breeding habitat that might occur within the analysis area from habitat change due to vegetative treatments.

Table 3.3- 23: Como Forest Health Activities that may Affect Western Toads or Their Habitat.

ACTIVITY	ALT. 2	ALT. 3	ALT. 4
Commercial harvest (acres)	1,476	1,295	1,117
Non-commercial harvest (acres)	531	929	770
Ground-based yarding (acres)	909	935	903
Cable system yarding (acres)	179	75	46
Low or moderate severity prescribed fire (acres)	936	934	454
Potential for prescribed fire to burn at historic severity	276	506	457
Potential for prescribed fire to burn hotter than historic severity	1022	734	None
Road construction (miles)	6.3	0	2.3

Alternatives 2, 3, and 4 would not change the amount of suitable terrestrial habitat for western toads within the project area, but they would alter the habitat quality in some suitable habitat. Western toad habitat would be improved by opening the forest canopy and creating small openings that toads apparently prefer (Bull 2006) relative to the area of commercial and non-commercial timber harvest displayed in Table 3.3- 23.

Western toad terrestrial habitat experiences fire relatively frequently, and toads are found in slightly higher abundance in early series of Douglas-fir forests (Kovalchik et al. 1988). Toad habitat would improve in the area of low and moderate severity prescribed burning, which would open the canopy and simulate some of the burned conditions that toads seem to do well in (Pilliod et al. 2006). However, the low intensity fire could also increase toad mortality in those units during the short period of time when flames were present in any particular area.

In Alternatives 2 and 3, Unit E (371 acres) would burn at a higher severity, removing surface objects such as logs and stumps. This has the potential to decrease hiding cover, shade and surface humidity which would prohibit western toads from using the area for next 3-5 years (Sullivan 1994), but post-fire sprouting of shrubby species could result in a longer-term, overall increase in low hiding cover (Agee 1993). Unit E would not be burned under Alternative 4.

Western toad breeding habitat rarely experiences fire except during extended dry conditions (Agee 1993). Fires would not be actively lit within the riparian areas, but would be allowed to burn into them. The extent of the effects of burning would depend on the timing of the prescribed fires. Fires during early spring could affect egg masses by reducing shade and increasing water temperatures. Any substantial change in runoff rates, erosion, or water tables caused by fire could degrade breeding sites (Sullivan 1994).

It is likely that there would be a change in the relative amounts of different types of prey organisms in the post-fire diet of western toads. Immediately after fire, many insects are present but those requiring shade do not adapt well to the more open conditions. In the longer term, there are differential responses to fire among prey organisms; ant populations were one-third higher in burned areas than in unburned areas, but beetles tend to decrease on burned areas (Black and Brunson 1971).

Machinery used during timber harvest could increase toad mortality if the equipment runs over toads. This would be most likely in the commercial harvest units where ground based yarding systems would be employed. There would be little risk of mortality from equipment running over toads in the commercial harvest units yarded using skyline or tracked-line machine systems. However, in Alternatives 2 and 4, construction of new system road, temporary road, and tracked line-machine trails to facilitate access within and between harvest units poses additional risks to toads. Felling trees could also kill toads in any of these harvest units, as well as in the non-commercial treatment units. The risk of toad mortality from falling trees is much less in the non-commercial units because the trees that would be cut are much smaller and would impact the ground with less force.

Hauling associated with harvest units could increase the risk of mortality to toads crossing or resting on roads. Running over western toads is especially likely at night during the summer, when toads seem to congregate on roads in some locations. Logging trucks and crew rigs often use these roads during the early morning hours to get an early start and avoid working in the heat of the day. Accessing these units during the dark may increase toad mortality due to vehicle impacts.

Aspen treatments in Alternative 4 would occur in areas of potential breeding habitat. However, the wildlife and fish biologists have field reviewed the sites several times and have not observed western toads or signs indicative of breeding sites. The effects of treating aspen would likely be minimal.

Design criteria for Riparian Habitat Conservation Areas that comply with Stream Management Zone regulations (see fisheries section) would be followed and would minimize impacts.

Cumulative Effects

The existing condition represents the sum of past activities. Previous timber harvest opened up the forest structure within harvest units to various degrees, which may have improved habitat conditions for toads. However, logging activities and the roads built to facilitate access to harvest units increased the risk of direct mortality to toads due to being run over by equipment or vehicles.

3.3.9.3 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

The regulatory framework providing direction for the protection and management of western toads and their habitat for CFHP comes from the National Forest Management Act of 1976 and the Bitterroot Forest Plan. Proposed activities in Alternatives 2, 3, and 4 of the Como Forest Health Project address the Forest Plan standards and other relevant laws, regulations, policies and plans for western toads in the following manner:

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. Western toads are 'apparently secure' in their global status (NatureServe 2014). Western toads have a large range in much of the western United States and western Canada, throughout which they are considered to be locally common. While the extent of threats range-wide is not known with certainty, there does appear to be multiple causes contributing to the range-wide trend. With over 100,000 individuals spread across their range and overall beneficial habitat impacts resulting from the implementation of the alternatives, it is unlikely that there would be any additive impact from the Como Forest Health project on western toads that would affect their viability or result in a trend toward federal listing for the population or species.

Forest Plan

Alternative 1 will not alter the existing condition and would comply with the forest plan.

Alternatives 2, 3, and 4 will protect important breeding habitat and would comply with the Forest Plan.

3.3.9.4 Summary of Effects

Implementation of Alternative 1 would have **no impact** on western toads or their habitat.

Implementation of Alternatives 2, 3, and 4 may impact individual western toads or their habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to population or species (Section 3.3.14).

3.3.10 Wolverine (*Gulo gulo*)

3.3.10.1 Overview of Issues Addressed

Habitat Quantity and Connectivity

In their 2013 Proposed Ruling, the United States Fish and Wildlife Service (USFWS) concluded that wolverine populations in the contiguous United States are a distinct population segment (DPS) and that the DPS appears to be at numbers so low that its continued existence could be at risk. This risk is caused by three main factors:

1. Small total population size;

2. Effective population size below that needed to maintain genetic diversity and demographic stability; and
3. The fragmented nature of wolverine habitat in the contiguous United States that results in smaller, isolate “sky island” patches separated by unsuitable habitats.

The primary threat increasing the risk factors to the DPS is from habitat and range loss due to climate warming. Other threats are minor in comparison to the driving primary threat of climate change; however, cumulatively, they could become significant when working in concert with climate change if they further suppress an already stressed population. These secondary threats include harvest (including incidental harvest) and demographic stochasticity (variability of population growth rates) and loss of genetic diversity due to small effective population sizes. All of these factors affect wolverines across their current range in the contiguous United States.

The USFWS discussed a variety of impacts to wolverine habitat, including: (1) climate change, (2) human use and disturbance, (3) dispersed recreational activities, (4) infrastructure development, (5) transportation corridors, and (6) land management. The primary impact of climate change on wolverines is expected to be through changes to the availability and distribution of wolverine habitat. While climate change is outside of Forest Service control, Forest Service activities have the potential to affect wolverine habitat and connectivity.

While there is no maternal or primary wolverine habitat located within the Como Forest Health project area, wolverines may forage and travel throughout the entire area. Primary habitat is located within 0.3 miles from the project boundary and maternal habitat is located 1.5 miles from the project boundary.

Issue Indicators

Since there is no mapped wolverine habitat within the project area, changes to the vegetative structure of denning or potential denning habitat was not used as an indicator. Because wolverines are thought to travel and forage throughout the project area, and because wolverines are thought to be fairly sensitive to disturbance by human activities, the following evaluation criteria were used to predict impacts to wolverine:

- “ Estimate user days in subalpine habitats, and
- “ Miles of road with motorized use in subalpine habitats.

3.3.10.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing wolverines comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

3.3.10.3 Affected Environment

Legal and Management Status

On August 13, 2014, the U.S. Fish and Wildlife Service withdrew a proposal to list the North American wolverine in the contiguous United States as a threatened species under the Endangered Species Act (ESA). According to the USFWS, the factors affecting the DPS as identified in the proposed rule are not as significant as believed at the time of the proposed rule’s publication (February 4, 2013) (Federal Register Vol 79, No 156). While it is clear that the climate is warming, after carefully considering the best available science, the Service has determined that the effects of climate change are not likely to place the wolverine in danger of extinction now or in the foreseeable future. As a result, the wolverine does not meet the statutory definition of either a “threatened species” or an “endangered species” and does not warrant protection under the ESA. The wolverine was returned to the Region 1 Sensitive Species list when the proposed rule was withdrawn.

Background

Wolverines are uncommon, solitary animals that range extensively through boreal coniferous forests and arctic tundra (Copeland 1996). Recent studies have refined our understanding of wolverine habitat use; fine-scale wolverine occurrence, documented using radio telemetry, is associated with high elevation alpine, subalpine and avalanche environments (Copeland et al. 2007, Krebs et al. 2007, Lofroth and Krebs 2007, Inman et al. 2007a). Wolverines primarily feed on rodents and carrion, though they are opportunists and consume berries, insects, fish, birds, and eggs when available. Ungulate carrion seems to be particularly important in the winter.

Recent research indicates that wolverine distribution in the mountains of the western United States is closely tied to high-elevation areas containing alpine vegetation, alpine climatic conditions, or relatively high probabilities of spring snow cover (Aubry et al. 2007). Copeland et al. (2010) found that 95% of summer and 86% of winter telemetry locations from studies in North America and Fennoscandia were consistent with areas having spring snow coverage. They found that in montane habitats at southerly latitudes (such as Montana), wolverines remain at high elevations throughout the year, avoiding lower elevation habitats with xeric conditions (Ibid).

Wolverine home ranges are very large, ranging from 142 to 175 square miles for females and from 163 to 611 square miles for males in several studies in Montana, Idaho and Wyoming (Hornocker and Hash 1981, Copeland 1996, Inman et al. 2007a). Copeland (1996) and Inman et al. (2007a) found that adult home ranges in areas with limited harvest were segregated by sex with little overlap between individuals of the same sex, but that male home ranges encompassed up to three female home ranges.

Local Habitat Status

Scientists with the Wildlife Conservation Society's (WCS) Greater Yellowstone Wolverine Program (GYWP) developed and refined a wolverine habitat model. The wolverine habitat model is based on habitat parameters including spring snow depth, terrain ruggedness index (related to steepness, which implies the presence of talus/boulder fields and avalanche terrain), latitude-adjusted elevation (related to the location of timberline), conifer cover, forest edge, and road density (Brock et al. 2007). The model outputs identify primary wolverine habitat in the Rocky Mountain states. Primary wolverine habitat is the area within the climactic limits that resident adult wolverines are expected to occupy. Model outputs were then overlaid with measured habitat criteria from 31 known wolverine den sites to identify areas likely to provide suitable wolverine denning habitat. Maternal Tier 1 habitat includes areas that contain attributes consistent with those measured around 95% of the known wolverine dens used in this study. Maternal Tier 2 habitat includes areas that are similar to Maternal Tier 1 habitat, but may lack some of the attributes measured around known wolverine dens (R. Inman, pers. comm.).

WCS biologists provided the Bitterroot National Forest with maps of predicted wolverine habitat based on the outputs of their model, and consented to let the Forest Service use these map products to analyze the potential effects of projects to areas classified as wolverine habitat (PF-WILD-002). The WCS maps indicate that the entire project area falls outside of Maternal Tier 1 and Tier 2 wolverine habitats (Figure 3.3- 21), though the project area may be utilized as foraging habitat in the winter. The analysis area is approximately 0.3 mile from Tier 2 maternal habitat and 1.5 miles from Tier 1 maternal habitat in the Bitterroot Mountains.

Local Population Status

Recent evidence of wolverines in the Bitterroot Mountains include multiple photographs and DNA samples taken from non-invasive carnivore survey stations in the Selway-Bitterroot drainages during 2013-2014, and reports of individuals being trapped in the Como and Lost Horse drainages in 2000,

2002, 2004, 2005, and 2010. Wolverine tracks were found just outside of the project area in March 2014, indicating wolverine use of the Como area outside of mapped maternal and primary habitat (PF-WILD-003). Additionally, a number of sightings of individuals or tracks have also been reported in both the Bitterroot and Sapphire Mountains over the past 10 years (PF-FPMON-038). This evidence indicates that wolverines are widely distributed in suitable habitat across the Forest, although population size is unknown.

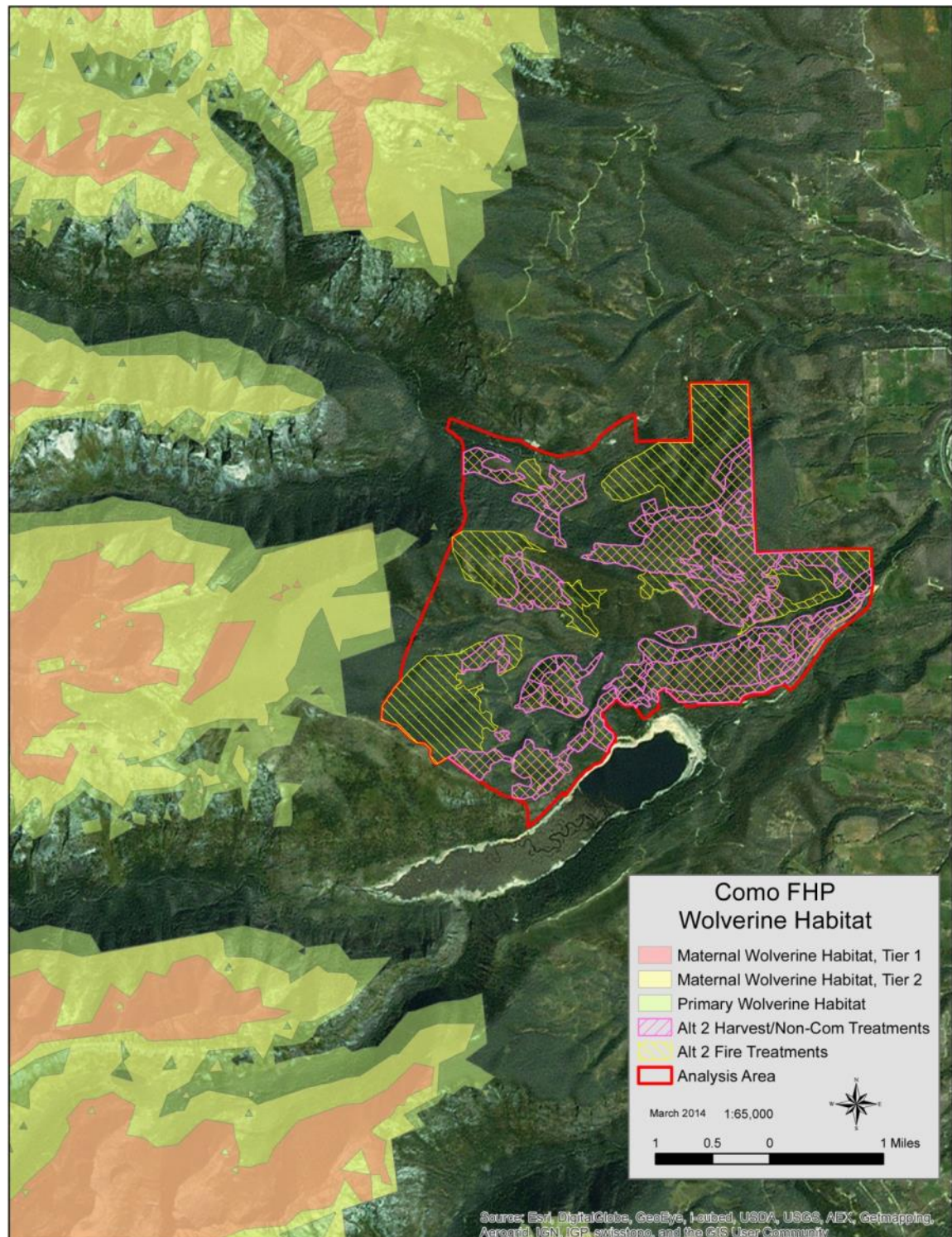


Figure 3.3- 21: Wolverine Habitats in and adjacent to the Como Forest Health Project Area.

Threats and Limiting Factors

In the proposed ruling, the USFWS determine that global climate change is the primary threat to the species, and that legal and incidental trapping of wolverines are substantial threats in concert with climate change.

Areas of persistent spring snow cover are potentially a limiting factor to wolverine breeding. The locations of known wolverine dens appear to be strongly correlated with areas of persistent spring snow cover throughout the circumboreal range of the species (Copeland et al. 2010). Almost all known wolverine reproductive dens have been located in alpine, subalpine, taiga, or tundra habitats (Magoun and Copeland 1998). A critical feature of wolverine denning habitat appears to be dependability of deep snow throughout the denning period (February through mid-May). Almost all verified reproductive dens were underneath 1 – 5 meters of snow (Ibid). In Idaho, wolverine dens occurred in snow-covered boulder talus in subalpine cirque basins located at high elevations, and consisted of long, complex snow tunnels leading under inaccessible boulder scree that provided a high degree of security (Ibid). In the Yellowstone area, wolverine dens occurred in subalpine habitats near timberline, and were under avalanche debris consisting of downed logs (Inman et al. 2007b).

Isolation from human presence and association with subalpine habitats characterize the general understanding of wolverine-habitat associations in the southern extent of the species' North American range (Copeland et al. 2007). Human activities in the vicinity of wolverine dens have been suspected of causing female wolverines to abandon dens and move kits, which could have negative impacts on reproductive success (Copeland 1996, Magoun and Copeland 1998). Squires et al. (2007) demonstrated that wolverine populations in small, isolated mountain ranges could be very susceptible to trapping pressure.

Desired Condition

The desired condition for wolverines within the Como Forest Health project area is to provide habitat to support a viable population of wolverines and to not jeopardize the continued existence of the wolverine population as described by the regulatory framework listed above.

3.3.10.4 Environmental Consequences

Methodology

This analysis assesses the effect of harvest-related activities on wolverine dispersal and habitat connectivity. The analysis also assesses the potential for motorized winter recreational access and use to cause wolverine disturbance or mortality in foraging habitat outside of the denning season.

Incomplete and Unavailable Information

The population size of wolverines within the Bitterroot Mountains is unknown at this time.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for wolverine is the Bitterroot Mountains to the west of the project area. This analysis area is appropriate to analyze effects from the actions of this project on wolverine in conjunction with past, present, and reasonably foreseeable future actions because any impacts caused by changes in recreational access outside of the analysis area will not be measureable. Additionally, incremental effects of proposed activities of this project to wolverines outside the analysis area would also not be measurable. The State level consideration is used to provide a broader context for the more localized effects analyzed.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 would only be in effect as long as any changes to recreational access remain in place. Given the large territories and high mobility of wolverines, cumulative effects would be minimal and temporary.

Trends and Broader Context

The Montana Department of Fish, Wildlife and Parks (FWP) classifies the wolverine as a Montana Species of Concern. The Montana Natural Heritage Program and FWP rank the wolverine as a G4 S3 species (Montana Field Guide 2013). This means that across its range, the species is considered uncommon but not rare (although it may be rare in parts of its range) and is usually widespread. It is apparently not vulnerable across most of its range (which globally extends across Northern Europe, Asia and North America), but there is possible cause for long-term concern. In Montana, the species is considered to be potentially at risk because of limited and potentially declining numbers, range or habitat, though it may be abundant in some areas.

The wolverine is one of the rarest and least-known mammals in North America (Aubrey et al. 2007). Since the 1800s, dramatic contractions have occurred within the historical range of the wolverine in the contiguous United States. Although the species once occurred in California, Utah, Colorado, and the Great Lakes states, its current range in the lower 48 states is limited to north-central Washington, northern and central Idaho, western Montana, and northwestern Wyoming (Ruggiero et al. 2007).

Wolverines in the western United States and the interior Columbia Basin occur widely at very low densities, but only in northwestern Montana are wolverine populations considered healthy and thriving (Witmer et al. 1998). In Montana, the wolverine was thought to be nearly extinct by 1920 from over-trapping. Wolverine numbers increased in the western, mountainous region of Montana from 1950 to 1980 (Hornocker and Hash 1981), presumably because of reduced trapping seasons on other furbearers and increased dispersals from Canada. Hornocker and Hash (1981) concluded that in Montana, extensive wilderness habitat coupled with more restrictive furbearer harvest regulations should provide secure wolverine populations in the foreseeable future.

Wolverine habitat in the Rocky Mountain States appears to be island-like in nature. Estimates of female territory capacity suggest that only six of these habitat islands are large enough to contain more than 20 adult female wolverines (Brock et al. 2007). Current levels of genetic diversity observed in United States populations indicate that a minimum of 400 breeding pairs of wolverines or 1-2 migrants per generation are required to ensure long-term genetic viability (Cegleski et al. 2006). This number of breeding pairs greatly exceeds the capacity of any habitat island. The persistence of wolverine populations in the United States is thus likely to be dependent on dispersal and subsequent gene flow between these islands (Brock et al. 2007). Schwartz et al. (2009) proposed that the Bitterroot Mountain chain bordering western Montana and eastern Idaho is a central "artery" for wolverine gene flow in the Rocky Mountains, potentially connecting wolverine populations in the Glacier National Park and Bob Marshall Wilderness and northern Idaho areas with those in the Greater Yellowstone Area and central Idaho.

Until 2012, Montana was the only state that still allowed limited trapping of wolverines. FWP trapping records indicate that between 1996 and 2003, trappers harvested an annual average of 14.4 wolverines throughout Montana, 1.25 within FWP Region 2, and 0.5 within Ravalli County (PF-WILD-004). From 2004 through 2010, trappers harvested an annual average of 7.3 wolverines throughout Montana, 1.6 within FWP Region 2, and 0.6 within Ravalli County (PF-WILD-005). Trappers removed a total of 166 wolverines from Montana between 1996 and 2010, and 15 wolverines from Ravalli County between 1976 and 2010 (PF-WILD-006). The recent decrease in the number of wolverines

harvested in Montana may reflect reductions in the trapping quota that occurred in 2008. Currently, wolverine trapping is illegal in Montana.

Recent evidence of wolverines in the Bitterroot Mountains includes a number of sightings of individuals or tracks from trappers, FWP, and Forest Service personnel. This evidence indicates that wolverines are widely distributed in suitable habitat across the Forest, although population size is unknown.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

Table 3.3- 24 displays the types of activities occurring in the Como Forest Health project area and their effects or potential effects on wolverine habitat components.

Table 3.3- 24: Summary of the Primary Cumulative Effects to Wolverines and their Habitat in the Cumulative Effects Analysis Area.

CONNECTED ACTION	PAST, PRESENT, OR FORESEEABLE	PRIMARY EFFECT, INTENSITY AND DURATION	CUMULATIVE EFFECT
Timber Harvest on NF prior to Forestry BMPs ¹	Past – prior to 1990	Negative, Central to existing condition, Long term	Removed much of the large wood in RHCAs, and road building era
Timber Harvest on NF After Forestry BMPs	Past –1990 to present	Negative, Minor, Short and Long term	Legacy roads retained, increased motorized access
Permitted Cattle grazing on the Forest	Past, Present, and Foreseeable	Lick – Moderate short and long term Lost Horse - Negligible	Cattle compete with ungulate populations for forage and introduce noxious weeds i
Dispersed Camping with vehicles	Past, Present, and Foreseeable	Rock – Minor Lick – Minor Lost Horse - Moderate All Long term	Loss of streamside vegetation, include large wood, and soil compaction. Dumping and sanitation. Human-wildlife interaction potential
Wildfires	Foreseeable	Unpredictable	Wildfires will occur in the analysis area. Extent and severity are difficult to predict.
Fuel Reduction (prescribed fire and thinning of understory trees)	Past, Present, and Foreseeable	Negligible short term effect, Mid-term benefit	No impact to maternal or primary habitat. Overall benefit effect on prey populations.

¹The Forestry Best Management Practices (BMP) became part of the Protection of Forest Resources Law in 1989. When the first audit was conducted in 1990, 78% of practices met or exceeded BMP standards. In 1998 the audit results achieved a 94% rating, and audit results have met or exceeded that rating ever since (MtDNRC 2012).

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the no action alternative.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on wolverine populations or suitable habitat because it does not include any vegetative treatments or any changes to existing summer or winter recreational access to the area. Prey populations (elk and deer) may eventually decline to some extent due to habitat changes from natural forces (see elk section), but this change would occur at a natural rate that would allow wolverines to adapt to finding new sources of carrion during the winter months.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore, there are no cumulative effects either.

Alternatives 2, 3, and 4

Direct and Indirect Effects

Alternatives 2, 3, and 4 would not alter any existing habitat conditions in maternal or primary wolverine habitat because this habitat is outside of the project area (Figure 3.3- 21). Project activities would disturb wolverines as they travel or forage through the project area during implementation relative to the amount of area treated in each alternative (Table 3.3- 25).

Vegetative components within units would change to some extent, but none of the proposed treatments would create unsuitable wolverine habitat. Altered vegetative structures could change the abundance and composition of the prey species community available for wolverine foraging. Such a change would be unlikely to have a quantifiable effect to wolverines since it would occur in such a small percentage of a typical wolverine territory.

Table 3.3- 25: Areas of Treatment by Alternative in the Como Forest Health Project

TREATMENT	ALT 2	ALT 3	ALT 4
Commercial harvest	1,476	1,292	1,115
Non-commercial harvest	531	929	770
Prescribed fire	1,319	943	202

Alternative 4 was designed to improve wildlife habitat throughout the project area through the recruitment of thermal cover, hiding cover, and old growth forest structure in addition to winter range forage improvements included in alternatives 2 and 3 as well. The improvements to habitat complexity and cover will improve wolverine prey populations within the project area.

Alternatives 2, 3, and 4 will not change the travel management status of any roads within the project area. Forest roads currently closed to motorized use that would be used during timber sale operations will be returned to their current travel status upon project completion. In Alternatives 2 and 4, the proposed new roads are on closed road systems and will also be closed to public use after project implementation. Although the new roads will not be open, they will increase access for illegal motorized use. Additionally, the project area will be more open after the vegetation management treatments, which may increase off-road travel. Increased motorized access will increase wolverine disturbances if they are in the project area. However, as stated in the recreation report, the project area will be monitored following project completion and areas of illegal off-road vehicle use will be blocked as needed for resource protection. Therefore, disturbance from illegal motorized use will be minimized.

Alternatives 2, 3, and 4 would increase potential disturbance to wolverines in the short term during project implementation activities. Potential disturbance during implementation would be confined to active units and associated haul routes. This alternative would decommission both open and undetermined roads in the project area, but none of the changes affects roads that are within predicted wolverine habitat. It is unlikely that proposed road closures would change the potential for disturbance to wolverines in the analysis areas. Disturbance impacts to wolverines from treatment-related activities would be minor, because wolverine territories are very large and wolverines tend to move long distances in a short period. Individual wolverines could easily avoid human activities confined to particular locations. These alternatives would not change the existing potential for disturbance to denning females or the risk of trapping mortality, because they do not alter existing access to predicted wolverine denning habitat during the winter.

Cumulative Effects

The existing condition represents the sum of past activities. Previous timber harvest units changed the vegetative structure across most of the project area, but did not affect the area's usability for wolverines. The road system constructed to facilitate timber harvest increased summer and winter human access to the area, which may have increased the risk of wolverine mortality due to trapping, poaching or vehicle impacts to some extent. The majority of predicted wolverine habitat next to the project area and along the Bitterroot Mountains is within the Selway-Bitterroot Wilderness (Brock et al. 2007), and as a result, it has not been impacted by recent management activities.

The impacts of management activities proposed in this EIS are analyzed in the Direct and Indirect Effects section, and are expected to have only minor impacts to habitat quality or populations. Reasonably foreseeable activities are summarized in Appendix A. The Bitterroot Travel Planning EIS may reduce motorized access on some roads and trails within the cumulative effects area depending on the alternative selected. While few of the routes that might be closed to motorized access are within the area of predicted wolverine habitat, reduced motorized access would still reduce cumulative effects to wolverines by a minor amount.

Temporary area and road closures during logging operations are expected to displace visitors that typically use the Lake Como area. As a result, use by horseback riders, mountain bikers and campers may increase in other already popular recreation areas that are closer to known wolverine habitat (Rock Creek trail, Lost Horse road dispersed sites). However, because these areas already experience a high level of recreational use, the additional displaced visitors spread across various areas would most likely not increase disturbances to an unacceptable level for wolverines in the area.

3.3.10.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

All alternatives would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. At the Bitterroot National Forest scale, key wolverine habitat is protected by wilderness and roadless area designation. The protected habitat within the Bitterroot Mountain chain bordering western Montana and eastern Idaho is considered a central "artery" for wolverine gene flow in the Rocky Mountains, connecting the wolverine populations in the protected habitats throughout Glacier National Park, Bob Marshall Wilderness, and northern Idaho areas with those in the Greater Yellowstone Area and central Idaho. At the Region 1 scale, over 73% of modeled wolverine denning habitat is protected within the Bob Marshall Wilderness complex and Mission Wilderness, with additional habitat in Glacier National Park providing connectivity to Canada. It is therefore unlikely there would be any effect on wolverines or wolverine habitat. In Alternative 1, the Como Forest Health project would cause no additional effects to the impacts of climate change and other activities outside of Forest Service control that would affect viability or result in a trend toward federal listing for the population or species. Under Alternatives 2, 3, and 4, there would be no additive effects from the project that would affect viability or result in a trend toward federal listing for the population or species.

Forest Plan

Alternatives 1, 2, 3, and 4 will maintain wolverine habitat connectivity, supporting the viability and movement of the species. Wolverine protection was considered during the project analysis and complies with Bitterroot National Forest Plan requirements (Forest Plan II-3) by providing and maintaining habitat for the species.

3.3.10.6 Summary of Effects

Implementation of Alternative 1 would have **no effect** on wolverines or their habitat. Implementation of Alternatives 2, 3, and 4 will not change the capability of wolverine dispersal or the connectivity of their habitat within the project area. Implementation of Alternative 2 will not increase the recreational access for motorized use within or around the project area. Implementation of Alternative 2, 3, and 4 **may affect, but is not likely to adversely affect** wolverines or their habitat (Section 3.3.14).

Management Indicator Species

The Bitterroot National Forest uses pileated woodpeckers as a management indicator species for the amount and distribution of old growth habitat (USDA Forest Service 1987: II-19). Forest plan standards for old growth are stated in the old growth section (pg. 4).

3.3.11 American Marten (Martes americana)

3.3.11.1 Overview of Issues Addressed

Habitat Quantity and Quality

American marten (marten) use predominantly cooler, moister forested habitat types and much of the preferred marten habitat resembles mature and old growth habitat. Dead woody debris is an essential component of this habitat (Strickland and Douglas 1987; Witmer et al. 1998). Resting and denning tend to occur in structures associated with late-successional conifer forests, including squirrel middens, large-diameter logs, large and medium diameter snags, and high canopy cover (Ruggiero et al. 1998). Most studies have reported that marten prefer forests with continuous overhead cover (Claar et al. 1999, Koehler and Hornocker 1977).

Buskirk and Powell (1994) hypothesized that tree species composition is less important to marten than aspects of forest structure that affect prey abundance and vulnerability and provide denning and resting sites. Such forest structures can be characterized by a diversity of tree sizes and shapes, light gaps and associated understory vegetation, snags, fallen trees and limbs, and limbs close to the ground. Forest structure should have three components important for marten: structure that leads to high diversity of dense prey populations, structure that leads to high prey vulnerability, and structure that provides natal and maternal dens and resting sites. A summary of old growth habitat and associated wildlife species in the Northern Rocky Mountains (USDA Forest Service 1990, p.34) cited research suggesting that at least 50% of female marten home range should be maintained in mature or old growth forest.

The Como Forest Health project area provides approximately 1080 acres of suitable marten habitat and 182 acres of potential marten habitat. About 223 acres of old growth forest in the project area meet marten habitat criteria.

Issue Indicators

Changes in stand structure, composition, and density of potential and suitable habitat are used to predict effects on marten and their habitat for each alternative because marten rely on these forest components for foraging, resting, and denning.

3.3.11.2 Regulatory Framework

The Bitterroot National Forest uses marten as a management indicator species for the amount and distribution of old growth habitat (USDA Forest Service 1987: II-19). As stated in the initial introduction, the regulatory framework for managing marten comes from the National Forest

Management Act, and standards and guidelines in the Bitterroot National Forest Plan specific to management indicator species.

Forest Plan

The Forest Plan provides a Forest-wide standard, as well as Management Area (MA) standards for the protection and maintenance of old growth habitat. The Forest-wide standard states:

“The amount and distribution of old growth will be used to ensure sufficient habitat for the maintenance of viable populations of existing native and desirable non-native vertebrate species, including two indicator species, the pine marten and pileated woodpecker.”

The Forest Plan standard applies to American marten (*Martes americana*), not its European cousin, the pine marten (*Martes martes*).

The Como Forest Health Project proposes treatments in MAs 1, 2, 3a, and 3c. The Forest Plan provides standards for old growth maintenance in each of these Management Areas. For MA 1, old growth stands should be 40 acres or larger, distributed over the management area. Within each 3rd order drainage, 3% of the suitable timberland will be maintained in old growth (USDA Forest Service 1987: III-4). This standard is the same for MAs 2 and 3a, except 8% of the suitable timberland will be maintained in old growth (USDA Forest Service 1987: III-10, III-16). The standard for MA 3c is slightly different in that 8% of non-riparian suitable timberland in each separate piece of MA 3c within each 3rd order drainage will be maintained in old growth (USDA Forest Service 1987: III-31). For all MAs, the Forest Plan specifies that patches of old growth habitat should be at least 40 acres and well distributed over the Management Areas. The forest stand is the unit of delineation for old growth habitat. In practice, if a stand of old growth habitat is less than 40 acres, it is still managed as old growth.

3.3.11.3 Affected Environment

Existing Condition

Legal and Management Status

In Montana, marten are managed as furbearers with annual quotas. The Montana Natural Heritage Program and Montana Department of Fish, Wildlife and Parks (MTFWP) rank the marten as a G5S4 species (MTFWP 2014). This means that at the global scale, the species is considered common, widespread, and abundant (although it may be rare in parts of its range), and not vulnerable in most of its range. At the state scale, marten are considered uncommon but not rare, and usually widespread. They are apparently not vulnerable in most of their range, but there is possible cause for long-term concern.

Local Habitat Status

Marten habitat was grouped into two categories: suitable and potential habitat. Suitable habitat currently has the components and forest structure necessary to meet the needs of marten, while potential habitat may not currently provide habitat but has the potential to develop into suitable habitat. Criteria for suitable and potential habitat can be found below in the methodology section.

The FSVEG database indicates the project area contains 1,080 acres of suitable habitat and 182 acres of potential habitat. The suitable habitat is found in the western half of the project area in large, connected blocks (Figure 3.3- 22). There are 223 acres of old growth forest that meet marten habitat criteria. The areas of potential habitat fill in portions of the gaps between the blocks of suitable habitat.

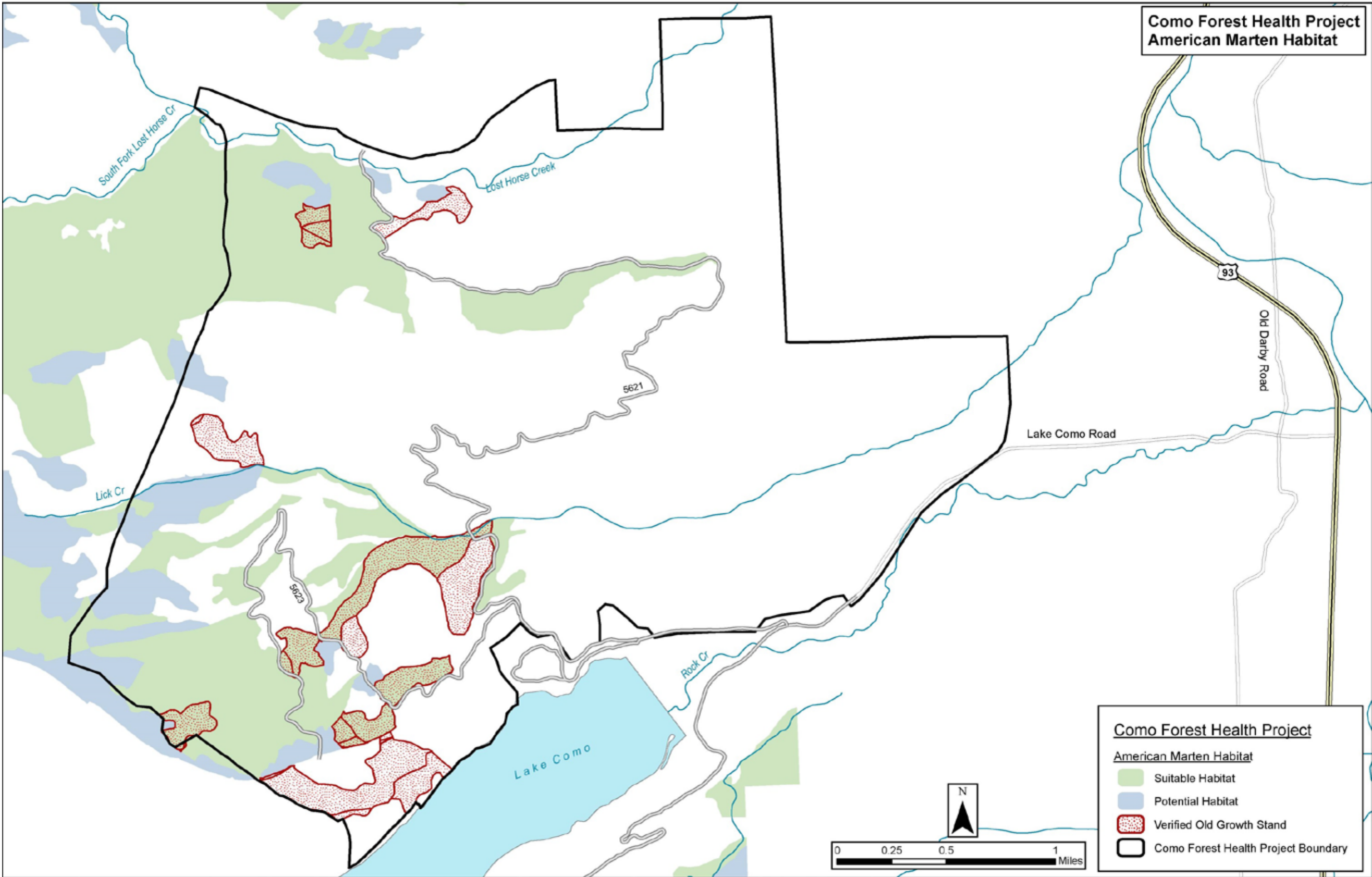


Figure 3.3- 22: American Marten Habitat in the Como Forest Health Project Area.

Marten habitat is found in treatment units: 3, 4, 5, 6, 39, 40, 41, 42, 45, 46, 47, 50, 51, A, C, and E (Figure 3.3- 22). Forty-two percent (42%) of the marten habitat in the analysis area is located outside of proposed treatment units.

Local Population Status and Trends

The Bitterroot National Forest (Forest) does not have population estimates for marten in the Como Forest Health Project area. In 2013, multiple-species bait stations set in areas of suitable marten habitat did not detect martens in the project area (PF-WILD-045). However, the Forest assumes that marten may occupy suitable habitat in the project area, since Forest Plan monitoring and similar multiple-species surveys done throughout the Forest show that marten appear to be common and widely distributed in similar habitat throughout the Bitterroot Mountains (PF-WILD-028; PF-WILD-045).

Threats and Limiting Factors

Several life history characteristics inhibit American marten population recovery from natural and human-caused population declines (Stone 2010). Marten have large spatial requirements for their body size, low population densities, and low reproductive rates (review by Buskirk and Ruggiero 1994). Small litter size and delayed maturity also make it difficult for populations to recover from large losses (Hauptman 1979, review by Buskirk and Ruggiero 1994).

Habitat loss due to both anthropogenic (e.g. timber harvest, trapping) and natural disturbance (e.g. vegetation succession due to climate change, insect outbreaks) are cited as major factors in the decline or extirpation of some marten populations (reviews by Berg and Kuehn 1994, Buskirk and Ruggiero 1994, Powell et al. 2003, Thomasma 1996, Wisdom et al. 1999, Zielinski et al. 2005). Changes in forest cover and the loss of mature forest due to logging and subsequent reforestation have been attributed to population fluctuations in the Northeast and California (Buskirk and Ruggiero 1994). Marten may also be impacted by forest management activities associated with insect outbreaks, including salvage harvest (Sherburne 1992, review by Ritchie 2008), road building, and postharvest treatment, which may remove large stands of dead canopy trees, create large openings, fragment the landscape, and damage developing understory vegetation and coarse woody debris (review by Ritchie 2008).

Trapping harvest is a major source of marten mortality where populations are trapped (Potvin and Breton 1995, Shults 2001, review by Buskirk and Ruggiero 1994) and may account for up to 90% of all deaths in some areas (review by Buskirk and Ruggiero 1994). Overharvesting has contributed to local extirpations (Berg and Kuehn 1994, Thomasma 1996) and trapping may impact population density, sex ratios (Payer 1999, review by Strickland and Douglas 1987) and age structure (reviews by Buskirk and Ruggiero 1994, Powell et al. 2003).

Habitat with complex physical structure may be more important than plant community composition in terms of habitat requirements for marten (Stone 2010). Complex vertical and horizontal structure provides protection from predators, access to subnivean space for winter foraging, and protective thermal microenvironments, particularly in winter (reviews by Bowman and Robitaille 1997, Buskirk and Ruggiero 1994). Components of complex physical structure positively associated with marten habitat use include abundant or dense snags, downfall, logs, stumps, coarse woody debris, root tip-up mounds, shrubs, and live ground cover (reviewed in Stone 2010). The loss of such structures within a home range would decrease habitat quality, potentially increase home range size, and reduce the area's carrying capacity.

Desired Condition

The desired condition for marten in the Como Forest Health project area is to provide habitat that supports a viable marten population and maintains old growth habitat that supports viable populations of old growth associated species as described by the regulatory framework.

3.3.11.4 Environmental Consequences

Methodology

For each alternative, changes in stand structure, composition, and density of potential and suitable habitat are used to predict effects on marten and their habitat. Suitable and potential habitats in the Como Forest Health Project were mapped through a query of the TSMRS/FACTS database.

Vegetation and physical data were collected for many of these stands in 2013. Some plot data is older, but still considered valid.

Suitable habitat was delineated as habitat type groups C, E, F, G, and H that are also currently identified as old growth or in a mature seral stage (mature, saw timber, multi-storied (with two or three levels)) (PF-WILD-058).

Potential habitat was delineated as habitat type groups C, E, F, G, and H that is in a young seral stage (seed, pole, sap).

Snag density and habitat were qualitatively analyzed relative to each alternative (Snag section). Effects on old growth forests were also analyzed relative to each alternative (old growth section).

Non-invasive DNA sampling using multiple carnivore bait stations occurred during the winters of 2012-2014 in the project area and across the Forest (PF-WILD-049).

Incomplete and Unavailable Information

Population estimates for marten in the project area boundaries are unavailable.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The analysis area for marten includes the four 3rd order drainages, 02a277-1, 02a282-3, 05d276-1, 05d276-2, which intersect the project area. This area totals 13,484 acres and is appropriate to analyze any incremental effects from the actions of this project on marten directly, indirectly, and cumulatively. Marten home ranges in Montana average about 720 acres for males and 175 acres for females (Burnett 1981). Thus, the analysis area of 13,484 acres is large enough to include 18 – 77 marten home ranges, although there may not be enough suitable habitat within that area, and is representative of effects of timber harvest, prescribed and natural fires, and natural tree mortality. The area is large enough to evaluate the ability of the landscape to support marten, but small enough not to obscure the effects of the alternatives. Within the analysis area, there are 3,156 acres of suitable marten habitat and 1,229 acres of potential marten habitat. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 on marten habitat would last until stands within or around the treatment areas return to the composition and density they have currently and can be considered suitable marten habitat.

Broader Context and Trends

Forest biologists have rated the suitability of the marten habitat across the Forest. Considering all the area rated, the Habitat Suitability Index for marten was calculated at 0.32. This index tells us

that on average, marten habitat on the Bitterroot National Forest (at least the 190,000 acres rated for suitability) is about 1/3 as good as the best marten habitat. This implies that marten are likely to occur in low densities in suitable habitat throughout the Forest. However, marten populations are likely to be robust in the corridors of high quality habitat that exist along many of the larger streams draining the Bitterroot Mountains. Lacy and Clark (1993) used computer simulations to show that marten populations are sustainable over time if a small number of migrants into the breeding pool maintained genetic variation, even in the face of trapping and logging.

A comparison of habitat required for a minimum viable population of marten to that available indicates that well-distributed habitat is well in excess to that needed across the Region, given the natural distribution of species and their habitats as mapped by the Montana Natural Heritage Program and the scientific literature. At a Forest-wide scale, there are approximately 393,400 acres of marten habitat more than is necessary to maintain a minimum viable population (Samson 2006). In other words, there is about 2,374% more habitat than is necessary to maintain a minimum viable marten population on the Forest.

The Bitterroot National Forest has been monitoring marten populations by searching transects for marten tracks since 1988. The Forest surveyed nearly 750 miles of transects between 1988 and 1996. In that period, an average of one marten track every 6.7 miles was observed. Variation between transects was high, ranging from one track every four miles to one track every eleven miles. It would appear that populations on the Bitterroot National Forest are much less dense than Canadian populations where Thompson et al. (1989) found nearly three tracks per mile of transect surveyed. The 1988-1996 data established a base line population index with which to compare future information. Each Ranger District has established permanent marten monitoring routes. These were established in developed areas, areas to be developed, and areas where no development is scheduled. The Forest has not had funding to complete many marten monitoring transects since 1997 except for nine marten transects completed in 2004. The average number of miles surveyed per marten track in 2004 was 0.6, considerably lower than the average of 6.7 miles/track recorded from 1988 to 1996. Put another way, a lot more marten tracks were seen in 2004 than in previous years. This apparent increase could mean that marten numbers have increased dramatically, but could also be a result of other sampling or environmental variables, not the least of which is the effect of pelt price on trapping activity. During years of abundant food supply, population densities of marten increase, which could be another factor (USDA Forest Service 1990, p. 34). Marten population densities and trend information is limited to that reported in the 2008 Forest Plan Monitoring Report (PF-WILD-028). The information is not sufficient to ascertain population densities or trends, but marten tracks have been detected on all the established monitoring routes indicating marten are well distributed across the forest. This distribution of habitat should allow individual martens to interchange between areas of habitat (USDA Forest Service 1990, p. 34).

The Forest participated in a Regional pilot study designed to determine fisher presence within 25 square mile grid cells in 2007 - 2013. The survey methodology is based on baited hair snares that are left in suitable fisher habitat for three weeks. Hairs collected from animals that attempt to reach the bait are then sent to the Genetics Lab at the Rocky Mountain Research Station facility for identification. Genetic testing of these hairs confirms the presence of both fishers and martens. Surveys performed by Forest personnel in 2007 to 2013 confirmed the presence of martens in riparian corridors along the Burnt Fork, Daly Creek, Skalkaho Creek, Nez Perce Creek, Soda Springs Creek, Mine Creek, Lost Horse Creek, Roaring Lion Creek, Tin Cup Creek, Sheephead Creek, and Hells Half Acre Creek.

Marten are known to be highly vulnerable to trapping and susceptible to overharvest (Powell 1979). MTFWP trapping records indicate that between 1996 and 2003, the average number of marten taken by trappers annually was 1,218 across Montana, 225 within MTFWP Region 2, and 76 within Ravalli County (PF-WILD-004). From 2004 through 2010, the average number of marten taken by trappers annually was 960 across Montana, 362 within MTFWP Region 2, and 181 within Ravalli County (PF-WILD-005). Harvest numbers appear to be higher in Region 2 and in Ravalli County in recent years, indicating that marten continue to be a relatively common species in the Bitterroot drainage and surrounding areas. Trappers removed 16,464 marten from Montana between 1996 and 2010. MTFWP trapping regulations do not currently limit the number of marten that can be harvested during the trapping season (PF-WILD-051).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Previous regeneration timber harvest over the past century in suitable marten habitat eliminated marten habitat in those units and created a fragmented landscape in the project area. Hargis et al. (1997) found that highly fragmented landscapes supported few if any resident marten, even though forest connectivity was still present.

The road system built to access these timber sale units also allows easier access to the area for summer and winter recreational users, who may disturb or kill marten. The road system also facilitates winter access for trappers, particularly in the Lost Horse drainage, who, as harvest records indicate, may harvest marten from portions of the analysis area and thus reduce the local marten population.

Successful fire suppression may have allowed many forested stands in the cumulative effects area to mature and become better marten habitat than might have occurred under the historic fire regime. The historic fire regime would typically produce a mosaic of burned and unburned stands over time. However, the buildup of fuels allowed by fire suppression suggests that if a fire occurs in the area it could be uncharacteristically severe in size and intensity. If a high severity fire occurs, it could eliminate large areas of marten habitat for 50 or more years.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

Alternative 1 would not have any discernable indirect effects on marten habitat over the short term. In the short term, habitat quality would improve at lower elevations as forest dominated by Douglas-fir mature, crown closures increase, and coarse woody debris accumulates. The risk of a high severity fire would increase as stand density, canopy closure, and fuel loads created by insects and pathogens increases. A large scale, moderate to severe fire would eliminate marten habitat. Bark beetles and root disease that kill large spruce and Douglas-fir trees create potential denning and resting trees. These trees may not be used unless the stand conditions needed for foraging are present nearby.

Alternatives 2 and 3

Design Features and Mitigation Measures

Design features are incorporated into Alternatives 2, 3, and 4 to ensure that snags and coarse woody debris are retained and maintained at historic levels by specific fire groups (Table 2.2-5). The retention and maintenance of these forest components will promote the development of marten

habitat. Monitoring reports and field notes from previous projects on the Bitterroot National Forest substantiate the effectiveness of these features (PF-WILD-028).

Direct and Indirect Effects

In Alternative 2, 55% of the suitable marten habitat in the project area would be treated (Figure 3.3- 23, Table 3.3- 26). This alternative would also treat 20% of the potential habitat within the project area. In Alternative 3, 46% of the suitable habitat and 21% of the potential habitat would be treated (Figure 3.3- 23, Table 3.3- 26). The habitat that is outside of the treatment units is left in fragmented patches in the southwestern corner of the project area that are too small to be defended as a territory or provide reproductive habitat (Figure 3.3- 23). One 112-acre patch of suitable habitat near the northwestern corner of the project area would not be treated in Alternative 2; it is not large enough to support a female territory or connected to other suitable marten habitat. In Alternative 3, large block of habitat along the western boundary would not be treated (Figure 3.3- 24), which would be large enough to support 2 female marten territories. The remaining habitat will be stringers between treatment units. In both alternatives, habitat outside of the project area connects to the blocks of suitable habitat that remains between the treatment units and would be large enough to support 7 female marten territories and 2 male territories.

The implementation of Alternatives 2 and 3 would decrease the amount of suitable marten habitat within the project area. Both the commercial harvest and moderate to high-severity prescribed burning (Unit E) would reduce canopy cover in marten habitat to below 40%, particularly in units with high fuel loads (Figure 3.3- 24, Table 3.3- 26). This reduction in canopy cover would convert existing marten habitat to potential habitat in the short term, with the area possibly becoming potential habitat in the future.

In general, timber harvest has a negative effect on marten due to the removal of overhead cover and large-diameter coarse woody debris (Stone 2010). The structural changes associated with logging reduce protective cover (Campbell 1979) and may also alter the abundance and distribution of prey species (Campbell 1979, Clark et al. 1979, Fuller and Harrison 2005, Hargis and Bissonette 1995, Hargis 1996, Thompson 1986, Thompson and Colgan 1994, reviews by Buskirk and Ruggiero 1994, Koehler et al. 1975) Table 3.3- 27).

Table 3.3- 26: Marten Habitat Treated in the Como Forest Health Project Area under Alternatives 2, 3, and 4

TREATMENT TYPE	SUITABLE (AC)			POTENTIAL (AC)			TOTAL HABITAT (AC)		
	ALT. 2	ALT. 3	ALT. 4	ALT. 2	ALT. 3	ALT. 4	ALT. 2	ALT. 3	ALT. 4
EXISTING CONDITION	1081			182			1,263		
Commercial	209	157	36	12	12	8	221	169	44
Non-commercial	46	8	1	1	26	23	47	34	24
Fire Only	340	327	12	23	0	0	364	327	12
Total Habitat Treated	595	494	49	37	38	31	632	531	80
Habitat Treated (%)	55	46	4	20	21	17	50	42	6

Timber harvest may lead to lower marten densities (Andruskiw et al. 2008, Campbell 1979, Payer 1999, Soutiere 1989), larger home ranges (Potvin and Breton 1995, Soutiere 1989), home range shifts (Poole et al. 2004), higher natural mortality (Potvin and Breton 1995), higher dispersal rates (Poole et al. 2004, Potvin and Breton 1995), greater daily movements, greater distances between core use areas within a home range, and shifts in daily activity patterns (Thompson and Colgan 1994).

Table 3.3- 27: Potential Treatment Effects on Marten Habitat for Alternatives 2, 3, and 4

TREATMENT TYPE	REDUCTION IN CANOPY COVER (%)	MODIFIED MARTEN HABITAT (ACRES)			POTENTIAL EFFECT ON MARTEN
		ALT. 2	ALT. 3	ALT. 4	
Group Select Units	25	168	124	0	Increase in habitat fragmentation, decrease in prey abundance. Decreases habitat quality but maintains suitability.
Commercial Units	40	52	45	44	Decrease in canopy cover to below 40% in most units. Decrease in denning and resting structures. Suitable habitat reverts to potential habitat.
Non-commercial Thin Units	No change	47	34	24	Decrease in marten prey densities (i.e. red squirrels). No change in habitat suitability.
Moderate to high severity burn (Fire Unit E)	50	315	315	0	Canopy cover decrease below 40% in most units. Decrease in denning and resting structures. Suitable habitat reverts to potential habitat.
Low to moderate severity burn Fire (Units A and C)	20	51	36	0	Canopy cover decreases below 40% in most units. Decrease in denning and resting structures. Suitable habitat reverts to potential habitat.
Low severity burn (Rest of units with Rx burning)	No change	269	172	73	Understory trees would be killed, but there would be little change in canopy coverage. No change in habitat suitability.

Non-commercial thinning will lead to a potential decrease in prey densities of species such as red squirrels, but will not change the current seral stage of the unit (Table 3.3- 27).

Alternatives 2 and 3 would decrease the amount of resting and denning habitat through the removal of structural components used for such purposes. Additionally, old growth units, 3, 4, 5, 6, 10, 45, 46, and 47, have a relatively higher density of resting and denning structures than non-old growth stands. Proposed harvest and burning treatments in the old growth units would reduce the availability of these components (Old Growth section). These stands also have a higher abundance of trees that develop heartwood decay, and subsequently, cavities, which are critical for marten reproduction. Removing these structures from treatment units would decrease the habitat suitability present in these units. Alternative 2 treats most of the old growth in the project area (240 acres) and Alternative 3 treats 192 acres in old growth units 3, 6, 10, 45, and 47.

Snag retention and coarse woody debris design features would maintain adequate levels of snags and coarse woody debris specific to the fire group of the units; however, the density and quality of the retained structures for resting, denning, and foraging habitat would be lower than the existing condition. Effects on snags for each alternative are discussed in detail in the Snag section and coarse woody debris effects are discussed in the Soils section.

Prescribed burning without pre-treatment of the fuels, particularly in units 40, A, C, and E has the potential to raise the burn severity. This could reduce the number of large trees, snags, and coarse woody debris. The loss of these stand components would decrease marten habitat quality by

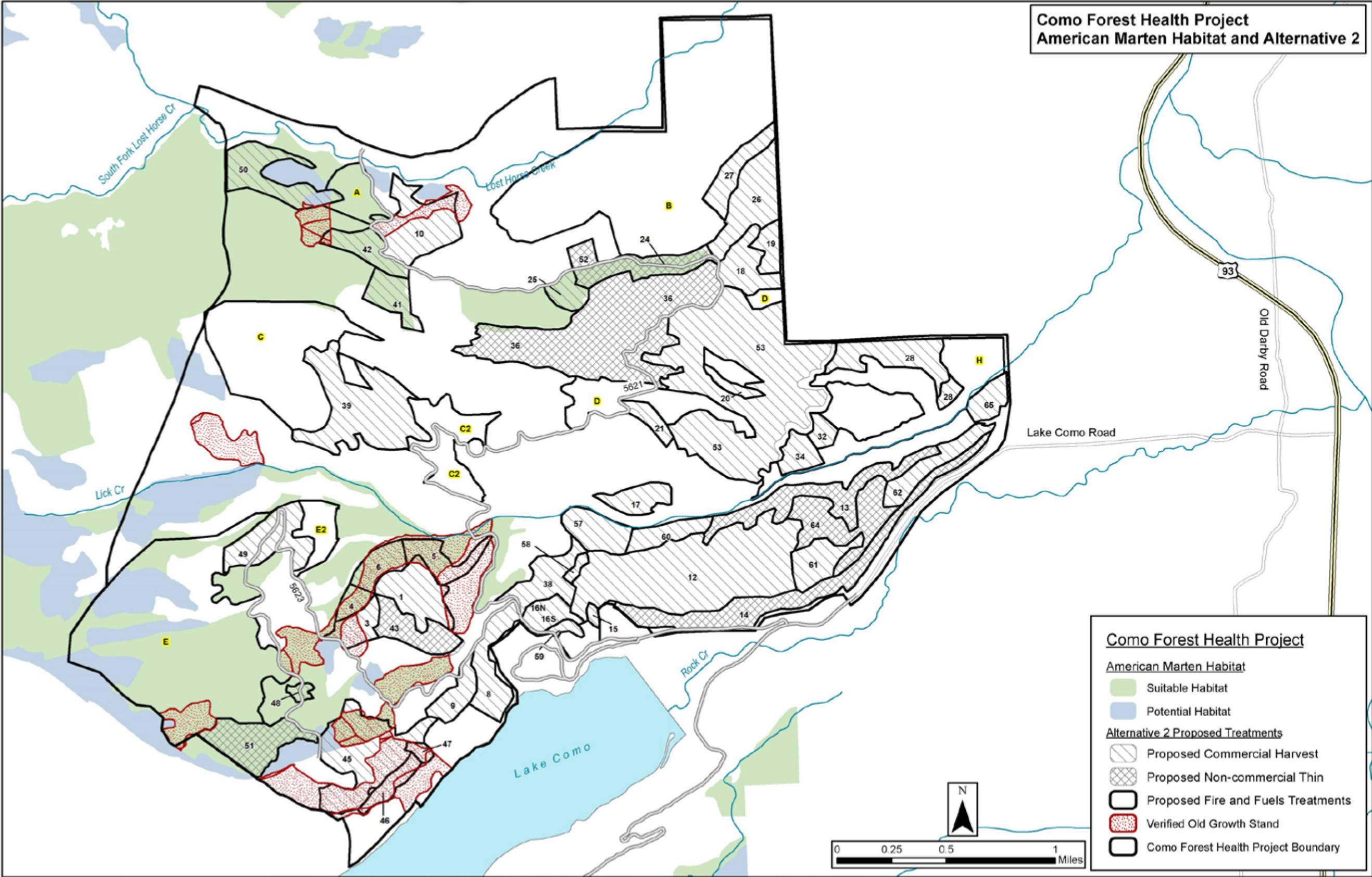


Figure 3.3- 23: Suitable and Potential American Marten Habitat with Alternative 2 Proposed Treatment Units

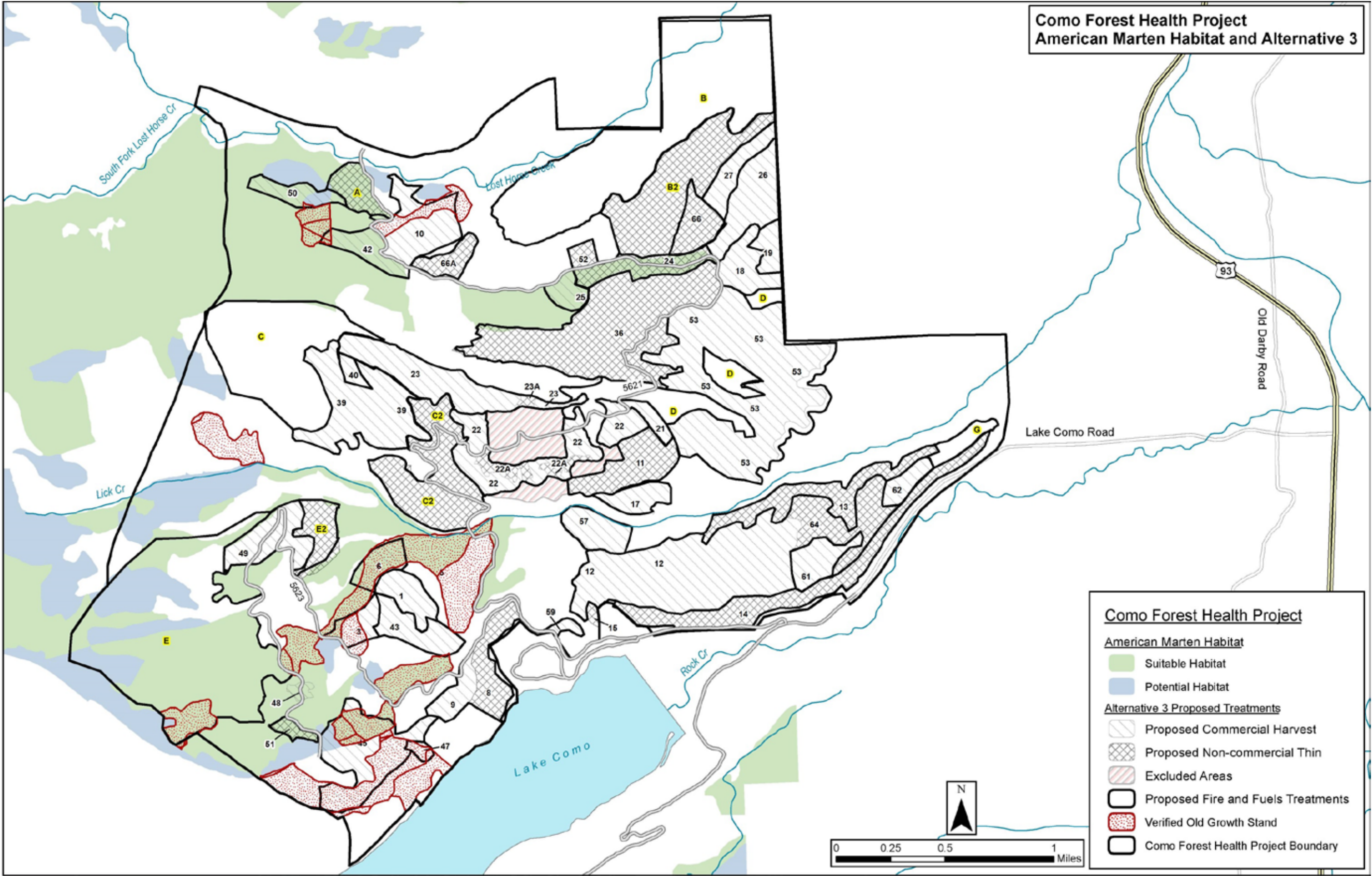


Figure 3.3- 24: Suitable and Potential American Marten Habitat with Alternative 3 Proposed Treatment Units

removing potential resting and den sites, as well as habitat for prey species. In units that would be commercially thinned prior to burning, the mature stand structure, large-diameter trees, and snags would be retained, which would enhance the development of key structures marten require.

The fuels in Units A, B2, C2, and E2 would be pre-treated in Alternative 3, which would keep the burn severity within the prescribed low to moderate parameters. Forest components necessary for marten habitat, such as snags, large trees, and coarse woody debris, would be maintained in a low severity burn.

Alternative 4 – Proposed Action

Direct and Indirect Effects

In Alternative 4, 6% of the marten habitat in the project area would be treated mostly through commercial treatment. Four percent of the suitable habitat and 17% of the potential habitat would be treated, leaving most of the marten habitat untreated. The habitat outside of the treatment units is in large, contiguous areas (Figure 3.3- 25) connected to habitat within and outside of the project area.

The treatment effects in Alternative 4 will be the same as those described for Alternatives 2 and 3 (Table 3.3- 27) but the extent of the effects would be much less because much less marten habitat would be treated.

Prescribed burn units would be thinned before burning, except Units C and D. Units C and D are within their historic fire return intervals and fuel loads are appropriate for their fire groups. All the prescribed fire units would burn at low to moderate severity, which would reduce the loss of snags, large trees, and coarse woody debris and maintain key marten habitat components (Meyer 2007).

Old Growth units will not be treated and will continue to provide suitable habitat. These units would also continue to be at risk for a high severity fire, if a fire were to ignite and was not suppressed. However, units around the old growth units would be treated, which would decrease the fire severity (Old Growth section). Also, units approaching old growth status would not be treated and would be old growth recruitment stands for future marten habitat.

The amount of undisturbed habitat remaining in the project area would be approximately 94% of the existing condition. The undisturbed habitat would be connected to suitable marten habitat within and outside of the project area and would be adequate to support 11 female marten and 3 male marten.

Cumulative Effects Alternatives 2, 3, and 4

The impacts of management activities proposed in Alternatives 2, 3, and 4 are analyzed in the Direct and Indirect Effects section, and are expected to negatively impact the quality and distribution of marten habitat.

Successful fire suppression may have allowed many forested stands in the cumulative effects area to mature and become better marten habitat than they might have under the influence of the historic fire regime. The historic fire regime would typically produce a mosaic of burned and unburned stands over time. However, the buildup of fuels from fire suppression suggests that if a fire occurs in the area, it could be severe in size and intensity. A severe fire could eliminate large areas of marten habitat for 50 or more years. Fires will continue to be suppressed within the project area, but may be allowed to burn in the wilderness and roadless area of the larger analysis area.

The Lost Horse road provides easy snowmobile access throughout the winter to trappers, who have harvested marten from portions of the area and may have reduced the local marten population.

Along open roads, large snags would continue to be cut by firewood cutters, but snags would remain abundant in many portions of the analysis area that are not accessible by open roads.

3.3.11.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. Alternative 1 would not reduce the amount of suitable marten habitat. Alternatives 2 and 3 would potentially reduce the amount of suitable marten habitat by 595 and 494 acres, respectively. This reduction would amount to about 19% and 16% of the 3,156 acres of habitat within the analysis area and to about 0.1% of the 410,700 acres of habitat currently present on the Forest. In Alternative 4, suitable marten habitat would be reduced by 49 acres, which would be a negligible loss at the Forest scale. This small area of suitable habitat is marginal because it is isolated from large habitat areas and is adjacent to a road.

At the Forest and Regional scale, marten habitat is abundant enough to support a viable population. Other factors outside of Forest Service control (such as global climate change, fire suppression activities on private lands, or conversion/subdivision of private forest) may negatively affect marten and their habitat. The effects of Alternatives 1, 2, 3, and 4 would not combine with the effects of past, present, or foreseeable activities that would affect viability or result in a trend towards federal listing for the population or species.

Forest Plan

The Bitterroot National Forest Plan Monitoring Report (PF-FPMON-038) summarizes Marten population monitoring efforts. Evidence from this monitoring report indicates marten are well distributed across the Forest.

The Bitterroot Forest Plan objective for old growth habitat is to maintain sufficient old growth habitat to support viable populations of old growth dependent species (USDA Forest Service 1987:II-5). Largely because of widespread, intensive harvest that occurred circa 1900, two Management Areas by third order drainages in the Como Forest Health project area do not meet Forest Plan standards. Since the only way to create old growth habitat is to grow the forest for more than 100 years, the forest structure and composition, including the snag and coarse woody debris components, need to be managed within their historical ranges. Alternative 1 will not reduce the amount of old growth habitat in the project area in the short term, because no timber harvest or prescribed fire would occur. Alternatives 2 and 3 propose treatments in ponderosa pine old growth units to reduce the risk of mountain pine beetle infestation and maintain fuel loads within the natural ranges of the fire groups (Silviculture and Old Growth sections). Treatments are also proposed in mixed conifer old growth units that would reduce the incidence of dwarf mistletoe and retain the ponderosa pine seral stand component. Silvicultural objectives would be to keep the essential characteristics of old growth forests, however, the implementation of these treatments has not been well tested and their outcomes are uncertain, especially in the mixed conifer old growth units (Silviculture section p. 45, 47). If the old growth units do not retain their old growth characteristics following treatment, Alternatives 2 and 3 would not meet the Forest-wide standard that states:

Old-growth stands may be logged and regenerated when other stands have achieved old-growth status (USDA Forest Service 1987: p. II-20)

Alternative 4 does not propose treatments in old growth units and therefore meets the intent of the Forest Plan standards.

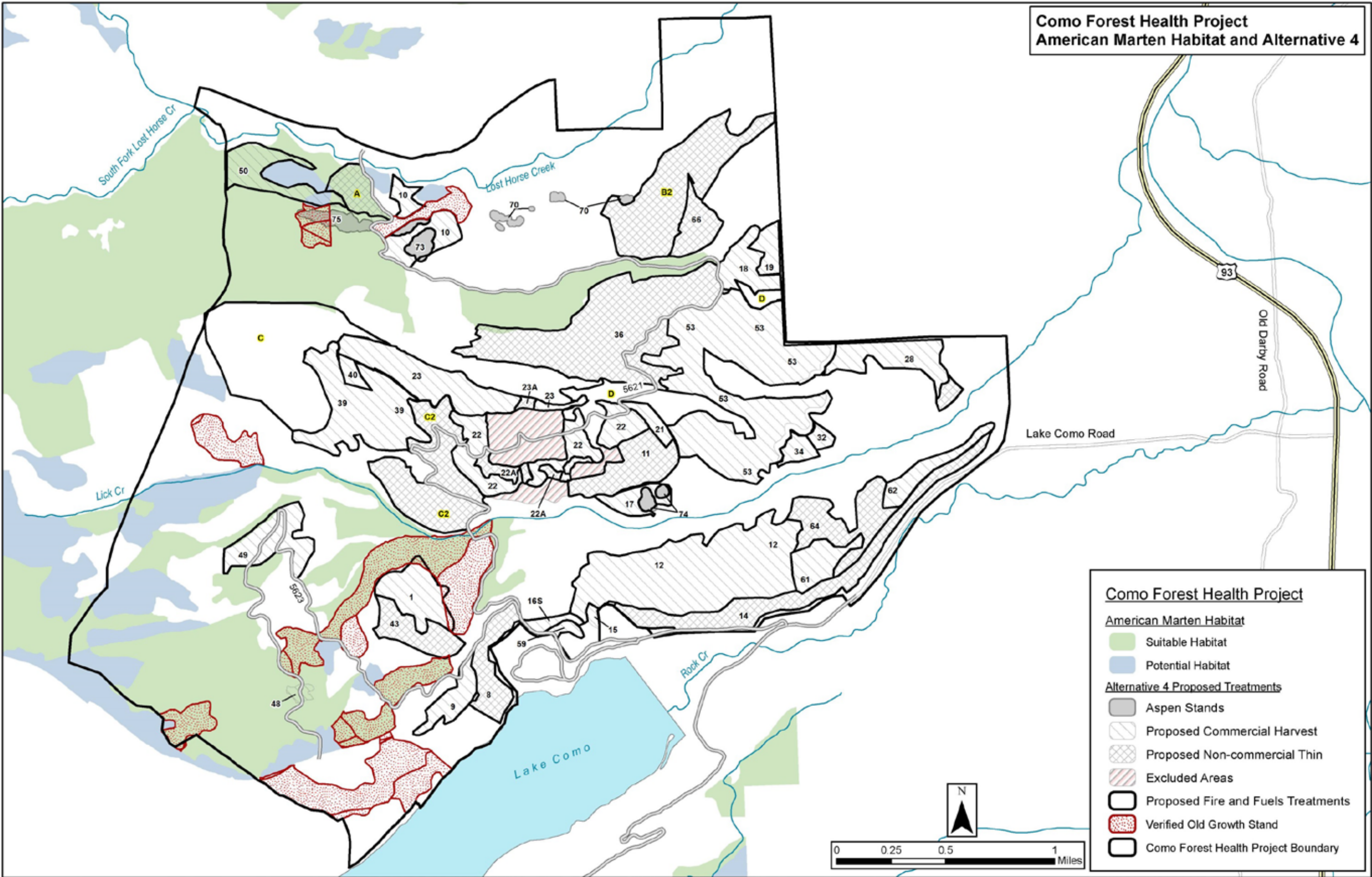


Figure 3.3- 25: Suitable and Potential American Marten Habitat with Proposed Alternative 4 Treatment Units

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires snag retention s that does not present an unacceptable risk to loggers' safety. No snags will be removed in the Como Forest Health Project area under Alternative 1.

The Forest Plan Record of Decision (p. 6) considered and permits salvage of dead or dying trees (PF-FPMON-002). The Forest Plan FEIS (Volume I, p. III-33, IV-22) specifically discussed the concern of stand replacing fires following mortality from insect epidemics and due to fire suppression (PF-FPMON-002). Salvage is also discussed in multiple areas of the Forest Plan and Record of Decision (PF-FPMON-002; PF-WILD-019), further supporting that the removal of snags, beyond what is necessary for safety, was not only intended but was programmed (FP p. II-20(6), II-20(2), II-22(2), III-8, III-14, III-21, III-29, and III-35). Alternatives 2, 3, and 4 are consistent with the Forest Plan because the snag retention guidelines described in Chapter 2 meet the intent of the Plan to provide vertical structure and maintain species viability while allowing salvage and fuel reduction activities.

3.3.11.6 Summary of Effects

Implementation of Alternative 1 would have no impact on marten or their habitat.

Implementation of Alternatives 2 and 3 would have negative impacts on marten habitat, and could reduce marten carrying capacity in the project area from 6 female marten to 2 females.

Implementation of Alternative 4 would have very minor short-term impacts on marten habitat but would not reduce the marten carrying capacity in the analysis area.

Treatments in marten habitat would reduce marten habitat quality by reducing overhead canopy and potentially the amount of down woody debris. Treatments within marten habitat would reduce the risk of stand-replacing fire, and would improve stand composition and structure in the longer term. This would result in improved marten habitat quality in the future.

3.3.12 Elk (*Cervus elaphus*)

3.3.12.1 Overview of Issues Addressed

Habitat Quantity and Quality

In mountainous regions like the Bitterroot Valley, elk spend the summer months in alpine habitat and the winter months in the lower valleys where forage and cover from the weather are more available. Elk (and other big game) winter range is described by different habitat components, including forage quality, forage/cover ratio, security, hiding cover, and thermal cover.

Many public comments focused on the effects the proposed project would have on big game habitat components. Alternative 4 was developed partially based upon these concerns and addresses elk habitat retention in the project area. More than 50 percent of the Como Forest Health project area is within Management Area 2, which has a goal of optimizing elk winter range habitat. Another 40 percent of the project area is in Management Area 3a or 3c, which have similar direction concerning big game winter range management. Overall, the entire project area (5,711 acres) is considered elk winter range, and 869 acres of that is considered thermal cover.

Issue Indicators

Because elk winter range contains habitat components important to their security and viability on a landscape, the following evaluation criteria were used to predict impacts on elk:

- Thermal cover in elk winter range,
- Hiding cover in elk winter range,
- Elk habitat effectiveness (Lyon 1983), and
- Elk security (Hillis et al 1991).

3.3.12.2 Regulatory Framework

As stated in the initial introduction, the regulatory framework for managing elk comes from the National Forest Management Act of 1976 and the standards and guidelines in the Bitterroot National Forest Plan specific to managing sensitive species.

The Record of Decision for the Bitterroot Forest Plan (USDA Bitterroot National Forest 1987) requires retention of 25 percent of the big game winter range as thermal cover. Other Forest Plan standards are related to maintenance of elk populations and habitat, and management of elk habitat effectiveness through the Travel Management process (USDA Forest Service 1987).

3.3.12.3 Affected Environment

Existing Condition

Legal and Management Status

Elk are considered common, widespread, and abundant by the Montana Natural Heritage Program and MTFWP (MTFWP 2014). Elk are a commonly hunted big game species throughout the Bitterroot Valley and across the country. The Bitterroot Forest Plan identifies elk as Management Indicator Species (MIS), and because of the high local value and the importance to the State's economy and tourism industry, elk populations will be monitored to assure that big game habitat is maintained on the Forest (USDA 1987).

Local Habitat Status

Elk Habitat Classification

Methods and criteria used for classifying elk habitat within the Como Forest Health project area is explained in the Methodology section below. Table 3.3- 28 and Figure 3.3- 26 show the breakdown of habitats within the project area. Habitat categories are overlapping in some cases. For example, hiding cover may also be counted as thermal cover, or hiding cover may also be forested forage.

Table 3.3- 28: Elk Habitat Classifications for Como Forest Health Project Area

HABITAT CLASSIFICATION	PROJECT AREA (ACRES)	PROJECT AREA (%)
Thermal Cover	869	15
Hiding Cover	3,077	54
Forested Forage	4,561	80
Open Forage	272	5
Winter Range	4,897	86
	WINTER RANGE (ACRES IN MA 2)	WINTER RANGE (%MA 2)
Thermal Cover	581	12
Hiding Cover	2,615	53

There are 869 acres of thermal cover in the project area. Within the project area, winter range covers 4,897 acres, and of that, 12% (581 acres) is considered thermal cover. Thermal cover is found mainly in the riparian corridors in the project area and in units: 4, 5, 6, 10, 12, 13, 17, 20, 26, 27, 38, 41, 42, 45, 50, 52, 53, 57, 58, 60, 62, 65, and E. However, lodgepole pine was a major component of unit E (371 acres). Loss of lodgepole pine canopies from mountain pine beetle-caused mortality may have reduced the canopy cover below 70% in some or all of the stands within Unit E, which would mean that they no longer qualify as thermal cover even though they may provide some thermoregulatory benefits to elk. Existing thermal cover could thus range from about 8% to 15% of the project area, depending on the degree of lodgepole pine mortality in Unit E and in similarly affected stands.

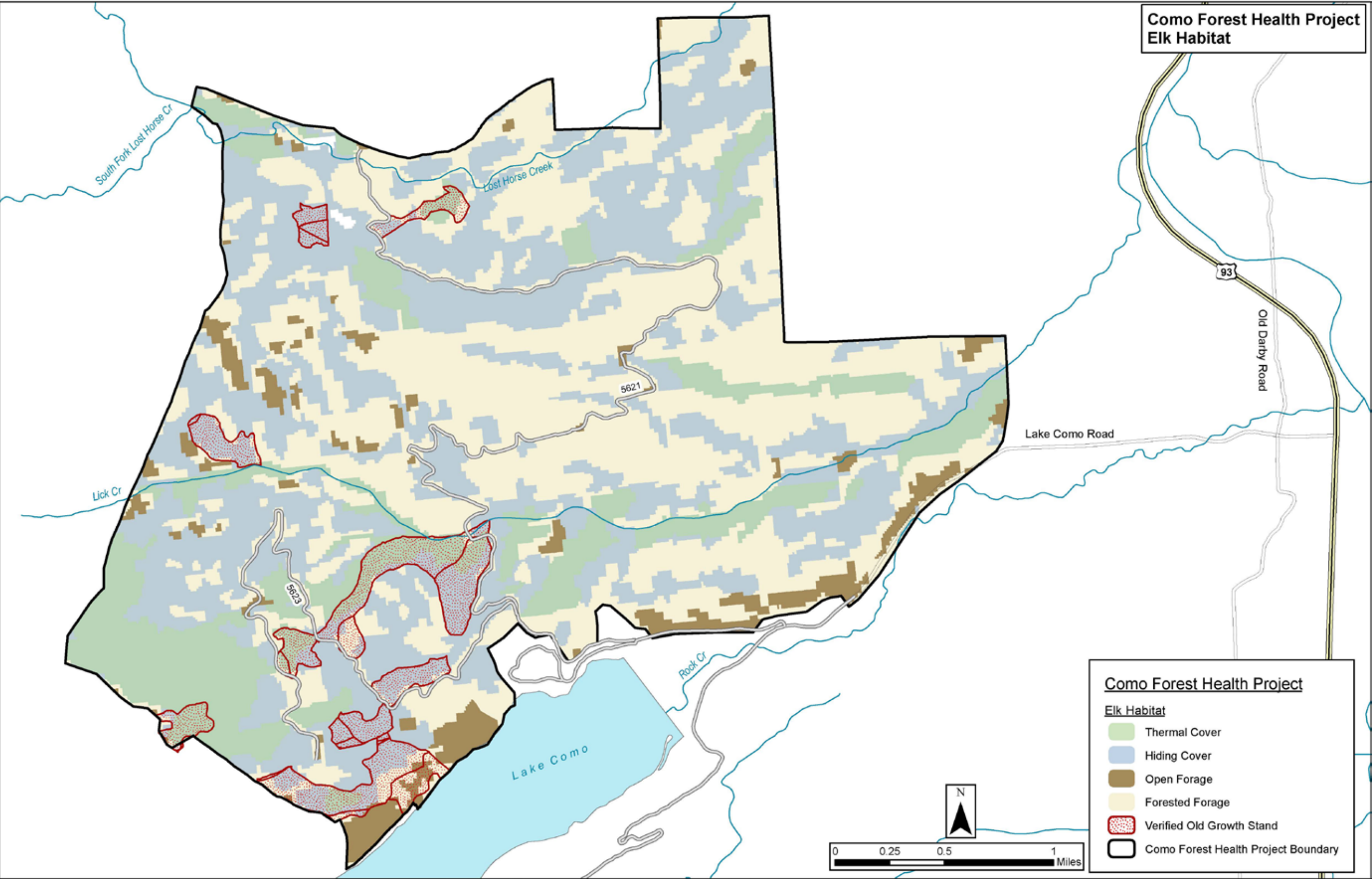


Figure 3.3- 26: Elk Habitat throughout the Como Forest Health Project

Hiding cover is common throughout most of the project area along riparian corridors, along the western boundary of the project area and on northern and northwestern aspects within the project area. Those aspects tend to contain denser stand structures, including more saplings and shrubs that limit sight distances. Many stands that do not qualify as hiding cover overall contain scattered patches of denser conifer regeneration and shrubs on minor north aspects. These patches provide opportunities for animals to hide and escape detection. Hiding cover is found in at least a portion of every treatment unit within the project area. There are 3,077 acres (54%) of hiding cover within the project area.

Open forage is limited across the project area and is confined to the southern boundary bordering Lake Como and NFSR 502. There are a few scattered patches within the rest of the project area, mostly located on the western side of the project area in old fire scars and rock outcroppings. Open forage is found in parts of units: 8, 9, 12, 14, 34, 36, 39, 45, 46, 47, 51, 53, 57, 61, 62, 64, 65, B, C, D, E, and H. There are 272 acres (5%) of open forage within the project area.

Forested forage is the most common habitat category in the project area. It is present throughout most of the project area, and the only areas where forested forage does not occur are in unit E and along riparian corridors due to the thick canopy cover in these areas. These forests contain limited conifer regeneration and tend to be rather open underneath the canopy. Sight distances in these stands are generally quite long and restricted mostly by the boles of the mature trees. Many of the old harvest units that have been pre-commercially thinned are too open to qualify as hiding cover but too heavily stocked to qualify as open forage. These stands are therefore classified as forested forage. Some stands are considered both hiding cover and forested forage. There are 4,561 acres (80%) of forested forage within the project area.

The low amounts of both thermal and hiding cover throughout the project area may increase the effects of weather and hunting mortality by not providing adequate protection for elk, however the hiding cover available may compensate. The high amounts of forested forage may have helped a little to reduce elk mortality due to hunting by reducing sight distances. At the same time, the shading caused by the canopies in these stands limits elk forage production, which may in turn increase winter mortality and reduce calf survival. Several noxious weeds (mainly spotted knapweed) also reduce forage production in areas where they have become established, such as on road shoulders and in forested areas with gentle slopes frequented by cattle.

Thermal and Hiding Cover in Elk Winter Range

The Bitterroot Forest Plan Record of Decision (ROD) (PF-FPMON-002) requires management of winter range vegetation to provide 25 percent of the winter range area in thermal cover as defined in Guides for Elk Habitat Objectives (USDA Forest Service 1978). This publication defines thermal cover as forested stands that average at least 40 feet tall with canopy closure of more than 70 percent (*Ibid*). The purpose of the ROD (PF-FPMON-002) thermal cover requirement was to provide habitat that at that time was believed to be necessary to meet the Forest Plan goals and objectives of maintaining the State's population goals for elk.

However, whether thermal cover is necessary for individual elk survival or elk population viability seems open to question. Research done on elk habitat over the past 15 years has shown there is less importance in thermal cover than was previously believed. Most notably, the work of Cook et al. (1998) at the Starkey Project in the Blue Mountains of northeastern Oregon, showed there were no positive benefits from thermal cover. Instead, a mix of open- and closed-canopy habitats resulted in superior animal performance when compared to homogeneous stands of thermal cover. Other studies suggest that elk use of dense cover is related more to protection and security needs, especially during hunting seasons (Rapp 2006). These findings have helped resolve contentious litigation over thermal cover standards on various National Forests and management direction for

thermal cover has been changed in many places. The Bitterroot National Forest has not revised the Forest Plan so the 1987 Forest Plan Record of Decision is still the guiding document until the Forest Plan is revised.

As discussed under cumulative effects, large amounts of winter range thermal cover do not seem necessary to support the State's elk population goals on the Bitterroot National Forest. However, while large amounts of homogenous thick stands of thermal cover do not seem to benefit elk in ways that were previously thought, there is still a benefit to retaining and recruiting thermal cover on the landscape in order to provide habitat diversity for elk and other wildlife species (Rapp 2006). Canopy coverage adequate for species that require it, such as fisher, are a better indicator of adequate ecosystem diversity than the outdated elk thermal criteria.

Thermal cover was analyzed separately for big game winter range within the Como Forest Health project area. All of the Como Forest Health project area is within elk winter range (PF-WILD-020). About 12% (581 acres) of the 4,897 acres classified as elk winter range within the project area qualify as thermal cover (Table 3.3- 28). This amount of thermal cover does not meet the optimal thermal cover percentage referenced in Guides for Elk Habitat Objectives (USDA Forest Service 1978), or the 25% standard set in the Bitterroot Forest Plan Record of Decision (PF-FPMON-002).

A Forest Plan amendment is needed to treat stands that qualify as thermal cover. Previous harvesting in the 1950s most likely reduced thermal cover in the Como Forest Health project area by decreasing canopy cover in the harvested stands. Thermal cover currently exists on 15% of the Como Forest Health project area. However, the decrease in thermal cover initiated an increase in forage productivity, which may be more important to wintering elk than thermal cover. Forage productivity would increase in response to the increased availability of water, nutrients, and light following the treatments. The newly available forage could offset the reduction of thermal cover (Lehmkuhl et al. 2001, Poole and Mowat 2005), and opening the forest will reduce the risk of losing a large portion of the forest to beetle-caused mortality improving the quality elk habitat.

Hiding cover, as defined by the Forest Plan ROD, is vegetation, primarily trees, capable of hiding 90% of an elk seen from a distance of 200 feet or less. The Guides for Elk Habitat Objectives (USDA 1978) suggest that for optimal proportions of habitat components on the landscape, 20% of winter range should also meet hiding cover requirements. Currently in the project area, 3,077 acres (54%) of winter range meets hiding cover requirements (Table 3.3- 29).

Table 3.3- 29. Elk Thermal and Hiding Cover in Winter Range.

	TOTAL AREA (ACRES)	WINTER RANGE (ACRES)	THERMAL COVER (ACRES)	THERMAL COVER IN WINTER RANGE (ACRES)	PERCENTAGE OF WINTER RANGE IN THERMAL COVER	HIDING COVER (ACRES)	HIDING COVER IN WINTER RANGE (ACRES)	PERCENTAGE OF WINTER RANGE IN HIDING COVER
Como Forest Health Project Area	5,711	4,897	869	581	12	3,077	2,615	53
Tin Cup – Lost Horse Elk Trend Unit	16,528	8,901	1,259	971	11	4,346	3,009	34

The Forest Plan does not delineate the unit size for calculating percentages for habitat classes. In order to analyze elk habitat at a meaningful scale, the areas MTFWP uses for trend counts was the basis of this analysis as well as at the project area scale. The MTFWP trend count areas are used as surrogates for elk herd unit. The MTFWP trend count units cover privately owned land and extend

into the wilderness. Because the Bitterroot National Forest does not have stand exam data in either of these areas (private or wilderness), the analysis focuses on non-wilderness National Forest in the MTFWP trend count unit. Comparisons between the elk habitat in the project area and in the whole trend count unit could not be made because of the data lacking in wilderness and on private land. The Bitterroot National Forest acknowledges the percentages and acreages used in the elk habitat analyses are not absolute, but the same assumptions about their use are made in the alternatives so they are useful for comparing effects with the elk habitat in the project area. Stand exam data is accurate and complete in the project area. The term 'trend count unit' includes only non-wilderness National Forest in this analysis unless otherwise noted.

Elk Habitat Effectiveness

Methods and criteria used to determine elk habitat effectiveness can be found in the methodology section below. The Forest Plan standard for elk habitat effectiveness (EHE) is:

"Manage roads through the Travel Plan process to attain or maintain 50 percent or higher elk habitat effectiveness in currently roaded third order drainages. Drainages where more than 25 percent of roads are in place are considered roaded. Maintain 60 percent or higher elk habitat effectiveness in drainages where less than 25 percent of the roads had been built (USDA Forest Service 1987, p. II-21)."

EHEs of 50% and 60% equate to 2 miles and 1 mile of open road per square mile, respectively (Lyon 1983). This standard supports the Forest Plan objectives of maintaining habitat to support viable populations of wildlife species, and cooperating with the state of Montana to maintain the current level of big game hunting opportunities (USDA Forest Service 1987, p. II-5).

The EHE model described by Lyon (1983) was the best information available at the time the Forest Plan was developed, however the model does not explicitly factor in noise to estimate the effects of motorized vehicles on the ability of elk to utilize habitat near roads. However, noise from vehicles likely affects the distance from roads or trails at which elk are disturbed, and would thus be one of the implicit factors that influenced the amount of elk use at various distances from open roads documented by Lyon (1983). Creel et al. (2002) showed that snowmobile use in Yellowstone National Park increased stress levels in animals as measured by glucocorticoid levels in elk and wolf feces, but does not explicitly measure or mention noise as a factor in such disturbance. Nonetheless, Lyon's model (1983) was incorporated into a Forest Plan standard, which is why the Bitterroot National Forest continues to analyze EHE through open road density.

Since the EHE model was developed, Rowland et al. (2000) suggest that it may be more biologically meaningful to evaluate road effects based on distances from roads and spatial pattern of roads than on traditional road density models. Their study suggests that the overall pattern of open motorized routes and the availability of areas outside the influence zone of motorized routes may be a more important metric than motorized route density in determining impacts to elk and other wildlife. Based upon this research, a model developed by Hillis et al. (1991) has been used in addition to Lyon's model (1983) for Bitterroot National Forest project planning in order measure security for elk from human activities, which was part of the original intent of the Forest Plan standard. The Hillis et al. (1991) model is used to measure elk security during hunting season when elk are most vulnerable.

Table 3.3- 30 displays the existing EHE percentages of the five third order drainages in the Como Forest Health project area, and compares it to the current Forest Plan standard (PF-WILD-021). Using the assumptions described below, EHE standards are not currently being met in third order drainages 02a282-3 and 05d276-2 in the project area.

Table 3.3- 30: Existing Elk Habitat Effectiveness Percentages by Third Order Drainage Compared to Forest Plan Standards. Rows in bold do not meet Forest Plan standards.

THIRD ORDER DRAINAGE NAME	AREA		EXISTING OPEN ROADS		EXISTING EHE (%)	FP MINIMUM EHE (%)
	(ACRES)	(SQUARE MILES)	(MILES)	DENSITY (MI/MI ²)		
02a277-1	4716	7.37	7.74	1.05	60%	50%
02a282-2	3087	4.82	0	0.00	100%	60%
02a282-3	1906	2.98	10.21	3.43	35%	50%
05d276-1	3800	5.94	2.41	0.41	78%	60%
05d276-2	3332	5.21	13.75	2.64	43%	50%

Elk Security

Methods and criteria for determining elk security are described in the Methodology section. Elk security is defined as “the protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activities” (Lyon and Christensen 1990). A security area, therefore, is any area that due to vegetation, geography and topography, will hold elk during a period of stress. Timber harvest and other land management activities affect elk vulnerability on a landscape by changing the structure, size, juxtaposition, and accessibility of elk security areas (Hillis et al. 1991). Therefore, elk security areas are analyzed across the project area to gauge the impacts of the proposed activities on elk vulnerability. Elk security areas have been mapped using the criteria from Hillis et al. (1991) and are defined as:

- “ Non-linear polygons of cover that are greater than 250 acres,
- “ Having more than 40% canopy cover, and
- “ Located more than one half mile from a road open to motorized use during the rifle hunting season.
- “ Adequate elk security exists when at least 30 percent of an elk herd unit qualifies as security area (Hillis et al. 1991).

The entire Bitterroot Forest has been divided into large units that MTFWP uses for elk trend counts. These trend count units serve as surrogates for elk herd units, since actual elk herd unit boundaries are largely unknown. Herd units are approximations of year-round home ranges for groups of elk based on where they are found in winter. Elk trend count units have been used for analysis of elk security at the project level.

The Como Forest Health project area is part of one delineated elk trend count unit, Tin Cup – Lost Horse. The Tin Cup – Lost Horse unit is 16,528 acres in size, and contains 3,743 acres of elk security (PF-WILD-022). This means that 22% of the trend count unit qualifies as security areas, which is lower than the recommendation by Hillis et al. (1991) for adequate elk security. The majority of the security areas within the Tin Cup – Lost Horse trend count unit are located west of the project area in the Selway-Bitterroot Wilderness and Selway-Bitterroot Roadless Area. Approximately 1,090 acres of the secure habitat are within the Como Forest Health project area boundaries.

Local Population Status and Trends

The Forest Plan objective is to provide sufficient habitat to maintain the current (as of 1987) level of big-game hunting opportunities (FP II-5, II-7).

Table 3.3- 31 displays MTFWP elk numbers observed in the spring for the TinCup-Lost Horse elk trend count area (PF-WILD-023). Data from 1987 is displayed for comparison with the Forest Plan objective.

Table 3.3- 31: MTFWP Elk Trend Count Numbers for the Como Forest Health Project Area.

	1987	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10 YR Avg.
Tin Cup – Lost Horse	33	36	49	38	104	77	95	83	207	152	188	103

The number of elk counted in the elk trend count area included in the Como Forest Health has exceeded the 1987 level every year for at least the past decade. Elk numbers in this area meet the Forest Plan objective of maintaining the 1987 level of big game hunting opportunities. The highest number of elk recorded within the trend count area was in 2011 with 207 elk counted. This peak in numbers is high relative to the 10-year average, which is still three times higher than the 1987 threshold.

Elk numbers have fluctuated mildly within the area since the beginning of the count in 1965. The tally within the trend count area has increased overall from the early 1980s (PF-WILD-023), and, with the exception of 2004 and 2005, the numbers within the trend count area continued to increase while the general elk population in the Bitterroot Valley diminished. Tin Cup-Lost Horse trend count unit is a part of hunting district 240 (HD240) in which elk numbers have been increasing since 2008 and currently reflects the typical number of elk that have been seen in the unit since the early 1980s. A MTFWP study attributed much of the decline in elk numbers throughout the Bitterroot drainage to increased antlerless harvests achieving a planned management reduction (Hamlin and Cunningham 2009). Predation and poor nutrition may also be factors. MTFWP estimates there are approximately 23 wolves per 1,000 elk within HD240 (PF-WILD-024), and wolf pressure may have forced elk to move to adjacent areas with less predation pressure. The Como Forest Health project area has not had residential wolf presence in it since 2011, when the Lake Como pack was lethally removed (See Gray Wolf Report). The Trapper Peak pack currently uses the area.

Calf/cow and bull/cow ratios (PF-WILD-025) for HD 240, which includes the Como Forest Health area, are shown in Table 3.3- 32.

Table 3.3- 32: Elk Calf/Cow and Bull/Cow Ratios for HD 240.

YEAR	RATIO CALVES/100 COWS	RATIO BULLS/100 COWS
2001	30/100	7/100
2002	33/100	14/100
2003	48/100	16/100
2004	39/100	20/100
2005	32/100	18/100
2006	39/100	61/100
2007	24/100	19/100
2008	25/100	21/100
2009	12/100	9/100
2010	25/100	9/100
2011	32/100	10/100
2012	29/100	7/100
2013	32/100	8/100

Until 2013, both calf/cow and bull/cow ratios had declined in HD 240 since 2007, as they had similarly throughout the Bitterroot drainage. MTFWP and local hunting groups are quite concerned about the future of the Bitterroot elk herd given these low calf and bull numbers. There is considerable debate over the cause of low calf and bull numbers, and MTFWP is in the third and final year of data collection for a multi-year elk-predator-nutrition study in the Bitterroot Valley to look at

potential causes. In 2010, MTFWP drastically reduced the number of elk permits available on Bitterroot Valley HDs in an effort to increase elk numbers by limiting hunter-caused mortality.

Most of the elk that inhabited the project area were winter residents. The elk currently found in HD240 have become year-round residents of the area between Roaring Lion and Blodgett Creeks (just west of Hamilton) and no longer migrate into the Bitterroot Mountains. As with elk in other areas, a majority of these elk reside on winter ranges on private ranches that allow only limited hunting prior to the rifle hunting season (Montana Department of Fish, Wildlife and Parks 2004).

Threats and Limiting Factors

Elk were extirpated from large parts of their range in the eastern and southwestern United States by the late 1800s and early 1900s because of livestock competition, overharvesting, agriculture and land development, and introduced diseases. However, by the late 1990s, elk numbers over much of the country had grown. Much of the increase in elk numbers during the 1900s was due to a combination of human translocations of elk, natural range expansion, and extensive wildfire and logging that resulted in abundant foraging habitats (Innes 2011).

Elk are sensitive to human disturbance and repeated disturbance may reduce elk reproduction and calf survival. Elk generally avoid habitat adjacent to roads year-round, but the greatest degree of avoidance occurred during calving and the rut (Witmer & deCalesta 1985). In general, elk avoid roads with human activity and avoid disturbances created by active logging operations (Skovlin et al. 2002). Other threats to elk populations include overharvesting; reduction in forage quantity and quality because of successional changes in habitats; and nonnative invasive plants.

Desired Condition

The desired condition for elk within the Como Forest Health project area is to provide habitat to support a viable population of elk and maintain big game habitat for the continued recreational use of the elk population as described by the regulatory framework.

3.3.12.4 Environmental Consequences

Methodology

Because elk winter range contains habitat components important to their security and limits their viability on a landscape, the following evaluation criteria were used to predict impacts to elk:

- Thermal cover in elk winter range
- Hiding cover in elk winter range
- Elk habitat effectiveness (Lyon 1983)
- Elk security (Hillis et al 1991)

Elk habitat classifications were calculated based upon stand exams performed in 2012-2013 within the Como Forest Health project area. The exam data was reported in FSVeg database and compared to VMap classifications. A detailed explanation can be found in PF-WILD-026. Classification guidelines (Table 3.3- 33) were based upon the Guides for Elk Habitat Objectives (USDA 1978).

Table 3.3- 33: Guidelines Used for Elk Habitat Classification

HABITAT COMPONENT	VEGETATION	CANOPY CLOSURE	SIGHT DISTANCE
Open Forage	Trees<6 ft tall; fewer than 10/ac	NA	
Forested Forage	Tree>6 ft tall; more than 10/ac	<70%	-
Hiding Cover	Trees or shrubs	NA	90% coverage at 200 ft
Thermal Cover	Trees >40 ft tall	>60%	-
Thermal and Hiding Cover	Trees >40 ft tall	>60%	-

Elk habitat effectiveness (EHE) was calculated using the continually updated Bitterroot National Forest transportation system database and the third order drainage Forest Plan spatial layer. For this analysis, roads that are closed to public use all year are counted as closed roads, even though we know that some level of unauthorized OHV use occurs on some of the roads. Roads that are closed seasonally are considered open roads for the purposes of the EHE analysis because elk are present within the roaded part of the project area during the period when these roads are open. Vehicle traffic on these roads thus reduces the effectiveness of elk habitat throughout the year. Roads considered in the calculations were open roads (Open, R5, R6, 90, open to all motorized during 10-15 to 12-01), greater than 0.5 miles in length that did not dead-end and were not paved. The calculated road density was then converted to EHE using the model described in Lyon (1983).

Elk security was calculated using the base level 2012 R1 V-Map Vegetation Mapping Project model as a spatial layer to analyze canopy cover and the updated Bitterroot National Forest transportation system database to calculate open roads within the elk trend count unit. Criteria used were based upon the security model developed by Hillis et al. (1991). Elk security areas are defined as areas located 0.5 mile from an open road (Open year-round, R-6, R13), with canopy cover between 40-60%, and 250 acres or larger.

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area, and analysis area, for elk is the portion of HD 240 between Tin Cup Creek and Lost Horse Creek, representing the area of the elk herd unit that surrounds the Como Forest Health project area. This project area is appropriate to analyze the incremental effects from project activities on elk directly, indirectly, or cumulatively because effects will be relative to the rest of the available elk habitat in the herd unit. Incremental effects of proposed project activities on elk populations outside of this analysis area would be diluted and would not be measureable. An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The consequences of the actions in Alternatives 2, 3, and 4 would last until the thermal and hiding cover reduced by harvest, thinning, and burning is replaced by similar forest structure. This could take 35 years until trees grow to be 40 feet tall with 70 percent canopy cover.

Broader Context and Trends

The Montana Natural Heritage Program and MTFWP classify elk as a G5 S5 species (MTFWP 2014). This means that at both the global and state scales, elk are considered common, widespread, and abundant, and not vulnerable in most of their range.

Thermal Cover in Elk Winter Range

Decades of fire suppression led to relatively large increases in thermal cover and decreases in available big game forage over what would exist in ecosystems adapted to frequent, low intensity fires. Timber harvest, especially clearcut harvest, increased forage locally as it decreased thermal cover. Historically, low intensity fires burned more area in habitat type groups A and B than timber harvest operations have affected in the last several decades. Timber harvest on this smaller scale together with fire exclusion allowed the development of more thermal cover than was typical in these habitat types.

Thermal cover is analyzed only on National Forest in the analysis area because private land has limited amounts. The proposed actions would reduce thermal cover below required forest plan standards on the dry forest sites where canopy closure seldom reached 70 percent under historical

fire regimes. Implementing these prescriptions would reduce the potential for high severity fires and maintain fire-adapted ponderosa pine forests.

Elk Habitat Effectiveness

Since the Forest Plan standard for EHE was implemented (USDA Forest Service 1987), many, but not all of the third order drainages on the Forest have been brought into compliance with the standard through additional road use restrictions. At one time, the Bitterroot National Forest transportation system had approximately 3,280 miles of roads. The breakdown of road management is as follows:

Bitterroot National Forest Roads	3,280 miles
Roads Decommissioned	600 miles
Roads closed year-round to motorized use	460 miles
Roads closed seasonally to motorized use	640 miles
Roads closed to full-sized vehicle use	644 miles
Roads open year-round to motorized use	936 miles

More than half of the roads that were once part of the Forest's transportation system are no longer open to full-sized vehicles (J. Pintok, pers. comm.). Open road densities are inversely correlated with EHE, so this reduction in open road densities indicates a substantial but unquantified increase in EHE across the Forest.

The reduction in open road densities that has occurred in many third order drainages has likely played a part in the dramatic increase in elk numbers in the Bitterroot drainage. Elk spring trend counts increased from 3,537 elk in 1987, when the Forest Plan was signed, to a high of 8,169 elk in 2005, although elk counts declined to 7,197 in 2007 (PF-WILD-023). This increase in elk numbers, which is well distributed across the Forest (Ibid), indicates that the elk population as a whole is able to tolerate the level of open road densities (and resulting EHE) that currently exist on the Bitterroot National Forest.

Elk Populations

The Como Forest Health project area is within HD 240. The MTFWP Elk Plan (MTFWP 2004, amended) combines HDs 240 and 260 and identifies elk population objectives for this larger combined area. Elk trend counts since the 2004 Elk Plan in these sub-areas (PF-WILD-023) are shown in Table 3.3- 34. Trend count figures for 1987 are also shown for comparison with the Forest Plan objective. The MTFWP population objective is 750 (MTFWP 2004, amended).

The elk count for HD 240 declined from its high point in 2004 to 2009, but increased somewhat in 2010 and 2011. In 2011, the elk count for HD 240 was about 4% below the population objective for this area.

Elk trend counts for the entire Bitterroot drainage generally increased from 1,613 in 1967, to a record high of 8,169 elk in the Bitterroot in 2005. Elk trend counts declined each of the next three years, and were down to 5,950 in spring of 2008 (PF-WILD-023), but increased to 6,605 by 2011. The reasons for this recent decline are the subject of considerable local debate, but MTFWP feels that the decline is primarily due to increased antlerless harvests implemented to achieve a planned management reduction in response to elk numbers being well over objectives (Hamlin and Cunningham 2009). Other possible causes include increased wolf predation and poor calf survival due to nutritional stress from poor forage production during recent hot, dry summers (PF-WILD-027). Poor calf/cow and bull/cow ratios observed in 2009 and 2010 indicate problems in elk herd

structure that could affect total herd numbers in the future. The 2010 count was approximately 11% under MTFWP's elk population objectives for the entire Bitterroot (MTFWP 2004, amended).

Table 3.3- 34: Elk Trend Counts by Hunting District Sub-area.

COUNT	1987	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
South Fork Lolo	0	183	133	164	116	79	111	89	27	36	89
Mormon-One Horse	187	123	148	44	69	84	138	132	94	106	132
One Horse-Sweeny	33	0	0	11	9	0	0	0	0	1	0
Sweeny-Bass	21	0	0	0	0	0	0	0	0	0	0
Bass- Kootenai	46	111	90	76	51	38	38	41	44	45	41
Kootenai-Big	29	45	39	50	52	43	0	21	26	71	21
Big- Bear	51	102	138	112	119	94	102	128	160	151	131
Bear -Fred Burr	0	12	0	0	0	0	0	0	0	0	0
Fred Burr- Mill	1	23	36	7	11	0	3	0	0	0	0
Mill – Blodgett	55	3	5	55	0	0	0	43	0	20	43
Blodgett – Roaring Lion	77	263	204	128	81	2	54	20	59	56	20
Roaring Lion – Lost Horse	26	115	98	89	70	32	104	134	102	76	134
Lost Horse – Tin Cup	33	36	49	38	104	77	95	83	207	152	83
TOTAL	480	1016	940	774	682	460	645	691	719	714	694

Subsistence, market, and hide hunting decimated elk herds across western North America in the 1800s; and by the mid-1880s, elk were gone from eastern Montana and their populations greatly reduced in western Montana. By 1910, elk numbers across North America were estimated to be less than 50,000 animals (MTFWP 2004). Elk numbers throughout the west have recovered dramatically since then. In 1922, the elk population in Montana was estimated at about 8,000 (Ibid). Through elk transplants, regulation of hunting, and natural increases in distribution, elk began to recolonize much of their former habitat. Today, all timbered mountainous areas of western and central Montana contain elk, and elk herds large enough to hunt inhabit isolated mountain ranges and timbered areas of eastern Montana. In 2004, post-hunting season elk numbers in Montana were estimated between 130,000 – 160,000 animals (Ibid).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

Table 3.3- 35 displays the types of activities occurring in the Como Forest Health project area and their effects or potential effects on elk habitat components.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the no action alternative.

Indirect Effects

Thermal and Hiding Cover in Elk Winter Range

Alternative 1 would not have any discernable indirect effects on thermal and hiding cover in the short term. The vegetation would continue to change with natural forces determining stand conditions at a rate that would allow elk to adapt to the changes at a natural, unnoticeable rate.

Table 3.3- 35: Activities in the Como Forest Health Project Area and their Effect on Elk Habitat

ACTIVITY	PAST, PRESENT, OR FORESEEABLE	PRIMARY EFFECT, INTENSITY AND DURATION	EFFECTS
Timber Harvest on NF prior to Forestry BMPs ¹	Past – prior to 1990	Negative, Central to existing condition, Long term	Removed much of thermal and hiding cover in project area
Timber Harvest on NF After Forestry BMPs	Past, present, foreseeable	Negative, Minor, Short and Long term	Legacy roads retained, increased motorized access
Rock Creek Fire Salvage	Past – 1988	Negative, Long term	6 acres of clearcut harvest
Permitted Cattle grazing on the Forest	Past, Present, and Foreseeable	Lick – Moderate short and long term Lost Horse - Negligible	Competition with ungulate populations, noxious weed introductions
Recreational Use, Dispersed Camping with vehicles	Past, Present, and Foreseeable	Rock – Minor Lick – Minor Lost Horse - Moderate All Long term	Loss of streamside vegetation, include large wood, and soil compaction. Dumping and sanitation. Human-wildlife interaction potential
Wildfires	Foreseeable	Unpredictable	Wildfires will occur in the project area. Extent and severity are difficult to predict.
Fuel Reduction (prescribed fire and thinning of understory trees)	Past, Present, and Foreseeable	Negligible short term effect, Mid-term benefit	No impact to maternal or primary habitat. Overall benefit effect on prey populations.

¹The Forestry Best Management Practices (BMP) became part of the Protection of Forest Resources Law in 1989. When the first audit was conducted in 1990, 78% of practices met or exceeded BMP standards. In 1998, the audit results achieved a 94% rating, and audit results have met or exceeded that rating ever since (MT DNRC 2012).

Elk Habitat Effectiveness

Alternative 1 would not implement any road use restrictions. Elk Habitat Effectiveness ratings for the third order drainages in the project area would stay the same and drainages 05a282-3 and 05d276-2 would continue to not meet Forest Plan standards. Existing disturbance impacts to elk from motorized vehicle use would continue.

Elk Security

Alternative 1 would not change the existing percentage of elk security in the short term because it would not change existing road use restrictions or alter existing cover areas. The area would continue to be at risk of a large, high severity fire, which could reduce the percentage of elk security in the longer term by reducing hiding cover.

Elk Populations

Alternative 1 would not have any discernable indirect effects on elk populations in the short term. Elk populations might eventually decline to some extent due to reduced forage productivity. The reduction of forage productivity would be a result of increasingly dense conifer canopies combined with the continued spread of noxious weeds over winter range. Thermal cover may be reduced in some areas as mountain pine beetle-caused mortality thins the forest canopies.

Cumulative Effects

There are no direct or indirect effects with Alternative 1; therefore there are no cumulative effects.

Alternatives 2 and 3

Direct and Indirect Effects

Elk Habitat Classification

Elk habitat is defined by four main components – thermal cover, hiding cover, forested forage, and open forage (Table 3.3- 33). Proposed treatments in Alternatives 2, 3, and 4 may affect the quantity or quality of elk habitat components (Table 3.3- 36) depending on the type of treatment (Table 3.3- 37).

Table 3.3- 36: Elk Habitat Classification after Implementation of the Alternatives and Relative to the Existing Condition as Represented by Alternative 1

HABITAT COMPONENT	EXISTING AREA (ACRES)	EXISTING AREA (%)	PROJECT AREA AFFECTED (ACRES)			HABITAT COMPONENT AFFECTED (%)		
			ALT 2	ALT 3	ALT 4	ALT 2	ALT 3	ALT 4
Thermal Cover	869	15	596	445	63	68	51	7
Hiding Cover	3,077	54	1,855	1,595	763	60	52	25
Forested Forage	4,561	80	2,590	2,598	1,909	57	57	42
Open Forage	272	5	130	122	114	48	45	42

Table 3.3- 37: Area Potentially Affected by Alternative Treatments

TREATMENT	COMMERCIAL			NON-COMMERCIAL			RX FIRE ONLY		
	ALT 2	ALT 3	ALT 4	ALT 2	ALT 3	ALT 4	ALT 2	ALT 3	ALT 4
Thermal Cover	252	129	49	79	61	14	266	256	0
Hiding Cover	817	628	417	233	369	271	806	599	75
Forested Forage	1,206	1,180	1,045	989	774	699	395	644	165
Open Forage	21	20	18	56	59	59	52	43	37

In general, Alternatives 2 and 3 would reduce thermal cover, hiding cover, and forested forage, though Alternative 3 would reduce it slightly less than Alternative 2. This would reduce the amount of thermal cover to about 5% of the project area in Alternative 2 and 7% in Alternative 3. The Forest Plan standard for thermal cover on 25% of winter range would not be met for the next 20-40 years until tree growth achieved 70% canopy closure.

The amount of open forage would increase in the project area by about 2 percent under both alternatives.

In Alternatives 2 and 3, hiding cover would be eliminated where it occurs in plantations scheduled for non-commercial thinning (Units 36, 66, 66a). Hiding cover may also be eliminated in stands on north aspects that support dense conifer or shrub understories, such as Units 50, B and E. Although elk might be more vulnerable to hunting-caused mortality in some areas, adequate hiding cover would remain to allow elk to escape much of the hunting pressure. Cover percentages would be below the levels considered “optimal” in USDA Forest Service (1978), but forage productivity would potentially increase. The increase in forage would not compensate for the loss of hiding or thermal cover as each habitat component provides different values to elk. Each habitat component is necessary on the landscape for elk survival. Additionally, there is very little cover within the project area available for elk and an abundance of forage. Providing more forage will not increase in an elk's cover or security from predators, hunters or the elements.

Post-treatment prescribed fire in many or most of the commercial timber units would stimulate forage production in the short term, when combined with reductions in conifer canopy cover resulting from timber harvest. Herbicide applications along skid trails, tracked line machine trails

and temporary roads would limit the spread of noxious weeds into areas that are currently weed-free.

In Alternative 2, fire effects would be more severe in units that are not thinned before the prescribed fire is ignited. Fire in untreated units would consume more vegetation, move into the canopy more easily, and burn the fuels more completely. The fire would be higher severity than in previously thinned units, and would decrease the overall elk thermal and hiding cover in the units. However, the uneven vegetative structure in the units may lead to uneven fire behavior that could potentially leave pockets of hiding cover.

In Alternative 3, the understory in prescribed burn units A, B2, and C2 would be thinned and the slash treated before the fire would be ignited. The pre-treatment of the units would keep the fire effects within the low to moderate severity levels. However, the pre-treatment would create a more uniform vegetative structure in the units without pockets of hiding cover that might not have burned with prescribed fire only.

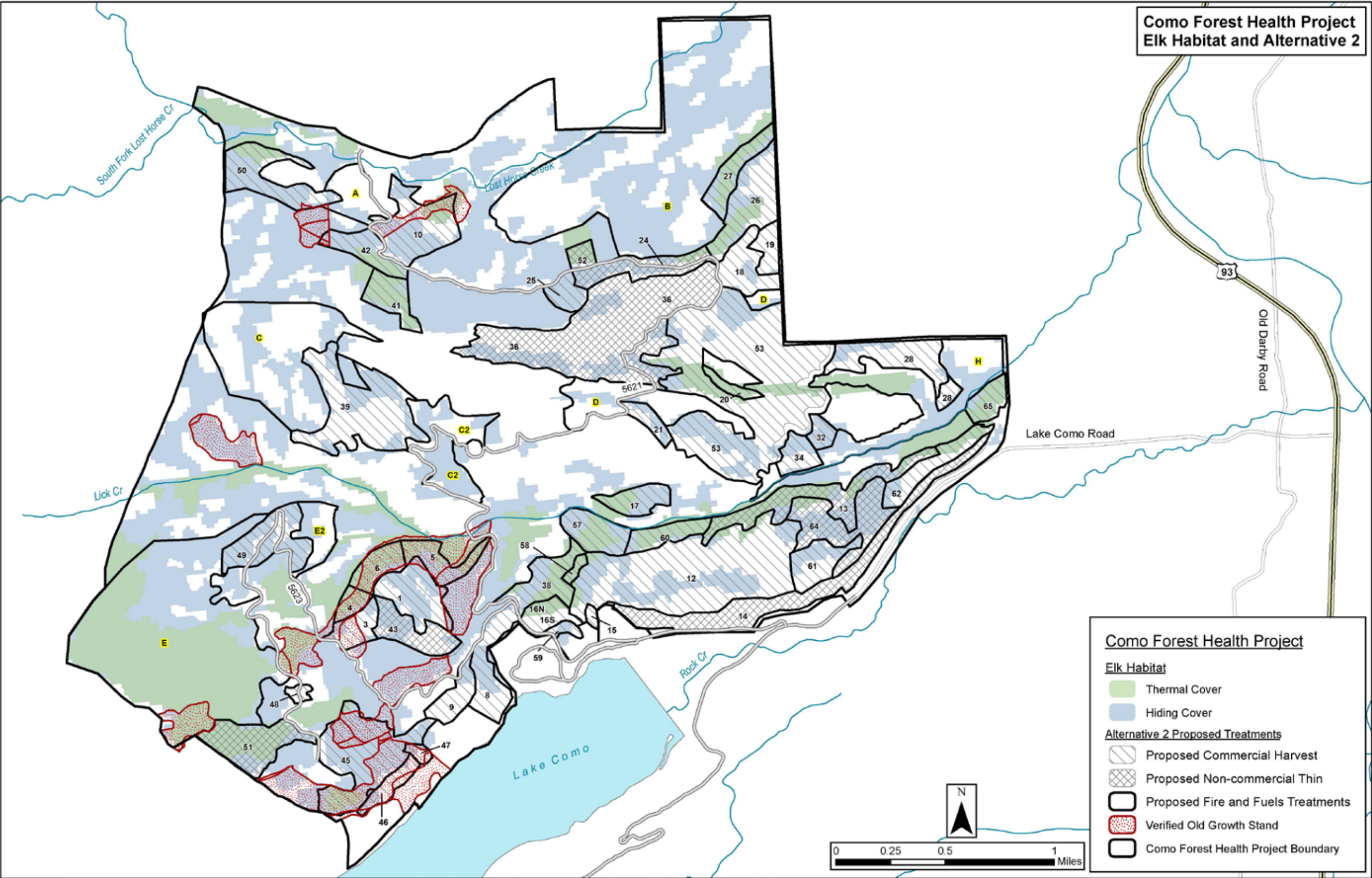
Thermal and Hiding Cover in Elk Winter Range

Alternatives 2 and 3 would potentially remove thermal cover characteristics from 596 and 445 acres, respectively, in the project area. This would reduce 68% of the thermal cover in the project area and leave thermal cover in small patches outside of treatment units. Though areas with 70% canopy closure and trees taller than 40 feet may meet the definition of thermal cover, it is non-functional if the area is small enough that weather conditions penetrate it.

Since the treatments in Alternatives 2 and 3 would reduce the amount of thermal cover in winter range from the existing level, thermal cover would be reduced further from the Forest Plan ROD requirement. This will be a detriment to elk populations in the project area. A Forest Plan amendment would be needed to implement the proposed treatments.

Treatments in Alternatives 2 and 3 would potentially remove 1,855 and 1,482 acres of hiding cover, respectively, in the project area through commercial harvest, non-commercial harvest, and prescribed fire treatments. This would decrease hiding cover 60 and 48%, and leave 1,222 and 1,595 acres of hiding cover, respectively, in the project area. The remnant hiding cover would be located primarily in three large patches in the western half of the project area (Figure 3.3- 27 and Figure 3.3- 28). These treatments would move the proportions of habitat components on the landscape further away from what is recommended in the Guides for Elk Habitat Objectives (USDA 1978) than what is currently on the landscape. Elk will be more vulnerable while in the area and a further reduction in cover with no correlated reduction in recreational use or predator numbers may cause elk to move out of the project area to an area with more protection.

Commercial, non-commercial and fire treatments in units on northern aspects and along riparian corridors would also reduce thermal and hiding cover. These are areas where thermal and hiding cover would historically have been continuous and thick. Treatments in Alternative 2 and 3 would also limit the amount of thermal and hiding cover available in the project area in the future by removing recruitment cohorts in stands across the project area. However, fewer units of thermal and hiding cover would be treated in Alternative 3 lessening the direct and indirect effects. A reduction in both types of cover would make elk more vulnerable to climatic conditions (hot sun in the summer, heavy snow in the winter), predation and to hunters.



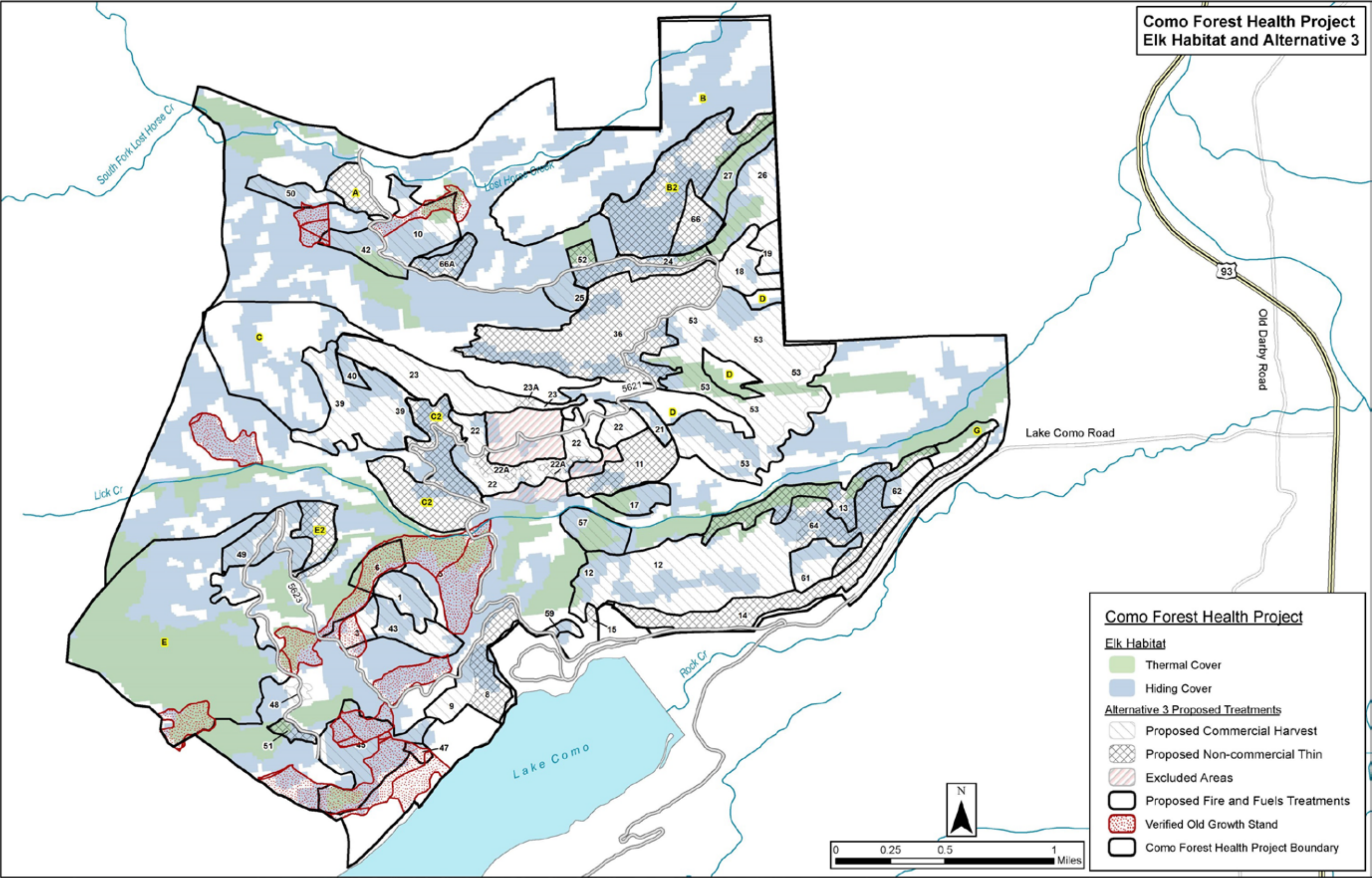


Figure 3.3- 28: Elk Thermal and Hiding Cover outside of Alternative 3 Proposed Units

Elk Habitat Effectiveness

Alternative 2 would not change the travel status of any roads currently being used in the project area. The 1.7 miles of proposed new system road would be closed year-long after the timber sale and are not included in the Elk Habitat Effectiveness (EHE) calculations. Temporary roads, tracked line-machine trails, and excavated skid trails are not included in EHE calculations either, as they are not open for public use and will be rehabilitated once project activities are finished. The two sections of system road proposed for decommissioning are less than 0.5 mile and are not long enough to be included in the EHE calculations; therefore, the change in their status will not impact EHE.

EHE ratings for the third order drainages in the project area would remain the same; drainages 05a282-3 and 05d276-2 would not meet Forest Plan standards. Since the proposed treatments would not decrease EHE, Alternative 2 meets the intent of the Forest Plan ROD requirement of maintaining EHE in third order drainages. Elk may be subject to disturbance if illegal motorized vehicle use occurs in the more open stands or on roads and trails before they are rehabilitated.

Elk Security

Alternatives 2 and 3 would reduce elk security within the project area by 243 and 237 acres, respectively (Table 3.3- 38); leaving a total of 848 and 854 acres of security habitat, respectively, in the project area, and 3,500 and 3,506 acres within the Tin Cup – Lost Horse elk trend count unit. This would maintain the elk security area at 21%; below the recommended 30% but almost equal to the existing condition (Alternative 1).

There would be no changes in the distances to open roads in secure areas under Alternatives 2 or 3, but canopy cover and the size of the areas would be affected (Table 3.3- 38).

Table 3.3- 38: Reduction in Canopy Cover per Treatment in Alternatives 2, 3, and 4

TREATMENT	CANOPY REDUCTION ESTIMATE	REDUCTION IN COVER AREA (ACRES)		
		ALT 2	ALT 3	ALT 4
Group select units: 4 ¹ , 6 ² , 45 ²	25% reduction in canopy cover	23	21	0
Commercial units: 3, 39, 40 ³ , 46 ¹ , 47, 48, 49	40% reduction in canopy cover	29	25	20
Non-commercial thin units: 51, C2 ³	No change in canopy cover	0	0	0
Fire unit E ² , E2 ²	50% reduction in canopy cover	179	179	0
Fire unit C	20% reduction in canopy cover	12	12	12
TOTAL REDUCTION IN ELK SECURITY (ACRES):		243	237	32
ACRES OF ELK SECURITY IN COMO FOREST HEALTH PROJECT AREA:		848	854	1,059
ACRES OF ELK SECURITY IN TIN CUP – LOST HORSE HERD UNIT:		3,500	3,506	3,711

¹Treatment is only in Alternative 2

²Treatment is only in Alternatives 2 and 3

³Treatment is only in Alternatives 3 and 4

Most of the elk security area occurs in the west side of the project area, which is where the reduction in elk security also occurs. This means that elk will be more vulnerable to hunting and disturbances caused by other human activities. However, the remaining 848 or 854 acres of security area, respectively, connects with the security areas in the roadless and wilderness areas so elk will have refuge from hunting and other human disturbances.

Population

Alternatives 2 and 3 would increase elk vulnerability to hunting mortality by reducing hiding cover and increasing sight distances in many of the treatment units. Hunters would be able to detect and

shoot at elk from longer distances within the units. Increased hunting mortality would reduce the number of elk in the project area by direct mortality or elk escaping to more secure areas. Indirectly, the open forest created by thinning and subsequent burning may invite illegal off-road motorized travel and increase elk disturbance.

Forage production would increase in the more open forest, which would improve elk survival through the winter. Better winter forage could improve birth rates and calf survival, which would tend to increase elk numbers.

Overall, it is likely there would be little discernable change in the elk population in the project area under Alternatives 2 and 3. An increase in forage production would benefit elk, but would not compensate for the loss of security as they are two different components that are both necessary for elk survival and cannot be compared to each other. Changes to elk populations resulting from implementation of this alternative would be difficult to quantify because elk populations are also affected by hunting regulations, predation levels, and weather. Currently, elk populations in the combined HD 204 and 261 are about 3% above population objectives identified in the 2004 Montana Elk Management Plan as amended (MTFWP 2004).

Cumulative Effects

The existing condition represents the sum of past activities. Previous timber harvest over the past 150 years reduced thermal and hiding cover for elk on the Bitterroot National Forest within the project area, but increased open foraging habitat.

The high density of roads constructed to access these timber sales greatly reduced elk habitat effectiveness and elk security on both sides of the Bitterroot Valley. Increased hunter access to elk summer ranges combined with many new openings apparently allowed unsustainable levels of elk harvest, as the total population declined and the number of bulls fell to unacceptable levels in the late 1980s. Declining elk populations caused the Bitterroot and Lolo National Forests, working with MTFWP, to close a number of roads, either yearlong or during the rifle season. These closures were effective in reducing elk mortality to sustainable levels, as total elk and bull numbers increased after implementation of the closures.

The project area includes the Trapper Peak grazing allotment. Ninety cow/calf pairs are permitted to graze this allotment between June 15 and August 31, with ten cattle pair grazing in the Lost Horse pasture between June 15 and July 31. Cattle grazing reduces the amount of forage available for elk to some extent, although most cattle use is confined to the road shoulders and areas with gentle slopes near the road system. The small number of cattle and the limited extent of cattle grazing make it unlikely that cattle grazing reduces forage availability enough to impact the elk population.

A potentially more serious effect of cattle grazing is the introduction and spread of noxious weeds. Cattle frequently disperse weed seeds, and the production of native forage plants can decline precipitously in weed-infested areas. Noxious weeds already established in the project area include spotted knapweed and houndstongue. Ongoing noxious weed control efforts using herbicides sprayed along roads limit the spread of these weeds, but there are patches of houndstongue scattered across the project area in locations that cattle frequent.

The effects of these ongoing activities will combine with the proposed actions of the project and will create a less desirable area for elk to be in.

Alternative 4

Direct and Indirect Effects

Thermal and Hiding Cover in Elk Winter Range

In this alternative, 63 acres thermal cover would be removed, which would reduce the amount of thermal cover in winter range one percent from the existing level (Table 3.3- 36). Therefore, alternative 4 meets the intent of the Forest Plan ROD requirement of maintaining winter range thermal cover.

Also in this alternative, there would be 763 acres of hiding cover within treatment units. The proposed treatments would not move the proportions of habitat components on the landscape further away from what is recommended by the Guides for Elk Habitat Objectives (USDA 1978) than what is currently on the landscape.

Additionally, there would be no commercial, non-commercial, or fire treatments in units on northern aspects, along riparian corridors, or in areas identified as thermal cover Figure 3.3- 29). The areas of thermal cover recruitment would increase the amounts of elk thermal and hiding cover on winter range in approximately 35 years.

Fire Units B and E would not be treated, and would provide large, connected areas of hiding and thermal cover along the western and northeastern boundaries of the project area.

Alternative 4 includes aspen treatments in Units 70, 73, 74, and 75. These treatments would regenerate aspen clones on 39 acres and would provide additional hiding cover as the aspen suckers grew.

Elk Habitat Effectiveness

Alternative 4 would not change the travel status of any roads currently being used in the project area. The 0.67 miles of proposed new system road would not increase road density because they would be closed at the end of the timber sale. EHE would not change from the current condition. Temporary roads, tracked line-machine trails, and excavated skid trails are not included in EHE calculations, either, as they are not open for public use and will be rehabilitated once project activities are finished. The two sections of system road that is being proposed for decommissioning are not long enough to be included in the EHE calculations and therefore, the change in their status will not change EHE.

Elk Habitat Effectiveness ratings for the third order drainages within the project area would remain – drainages 05a282-3 and 05d276-2 would continue not to meet Forest Plan minimum standards. Since the proposed treatments would not decrease EHE from the existing level, Alternative 4 meets the intent of the Forest Plan ROD requirement of maintaining EHE in third order drainages. Disturbance impacts to elk from motorized vehicle use are expected to increase due to potential illegal use on the newly built roads and TLM trails.

Elk Security

Alternative 4 would reduce elk security within the project area by 32 acres (Table 3.3- 38). This would leave a total of 1,059 acres of security within the project area, and 3,711 acres within the Tin Cup – Lost Horse elk trend count unit. This would maintain the percentage of secure areas within the elk trend count unit at 22%, below the recommended 30% but equal to the existing condition.

There would be no changes in the distances to open roads in secure areas, but canopy cover and the size of the areas would be impacted.

The reduction in elk security acres will occur along the west side of the project area. This means that elk will be more vulnerable to hunting and disturbances caused by other human activities. However,

there are still 1,059 acres of security areas within the project area, mostly along the western side of the project area. These security areas connect with the security areas within the roadless and wilderness areas and provide elk protection from hunting and other human disturbances.

Population

Similar to the other alternatives, this alternative would decrease elk vulnerability to hunting mortality by increasing sight distances in many of the treatment units. However, because the units containing thermal cover, hiding cover and recruitment cover would not be treated, the level of vulnerability would be considerably less than in Alternatives 2 and 3. Increased hunting mortality might reduce the number of elk within the project area to some extent. Indirectly, the openness resulting from thinning and subsequent burning may result in an increased number of disturbed elk if off-road travel increases as well. These impacts will be slightly less than the impacts in Alternatives 2 and 3 since fewer acres will be treated in Alternative 4 and areas for elk to escape to will be retained on the landscape.

On the other hand, increased forage production resulting from reduction of overstory canopies in some units would improve overwinter survival, birth rates, and calf survival, which would tend to increase elk numbers. Again, this impact will be slightly less than in Alternative 2 since fewer acres will be treated. However when integrated with the aspen clone treatments proposed in Alternative 4, the overall increase in forage production would contribute to an increase in elk numbers across the project area.

Overall, it is likely the elk population would increase in the project area from implementing this alternative. However, changes to elk populations resulting from implementation of this alternative alone would be difficult to quantify because elk populations are also affected by hunting regulations, predation, and weather. Currently, elk populations in the combined HD 204 and 261 are about 3% above population objectives identified in the 2004 Montana Elk Management Plan, as amended (Montana Department of Fish, Wildlife and Parks 2004).

Cumulative Effects

Cumulative effects will be similar to those in Alternatives 2 and 3.

3.3.12.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity for plant and animal communities and ecological sustainability. Elk numbers have been increasing across the west and in Montana since the early to mid-1900s. Statewide, post-season elk numbers increased from 8,000 in 1922 to 55,000 in 1978 and to about 160,000 in 2004 (MTFWP 2004). Thus, there are no viability concerns for Rocky Mountain elk in Montana or on the Bitterroot National Forest. This is supported by their global status of 'GS5' and the statewide status of 'S5', which are both defined as "common, widespread, and abundant".

Forest Plan

Table 3.3- 39 summarizes the elk habitat components relative to Forest Plan standards and guidelines.

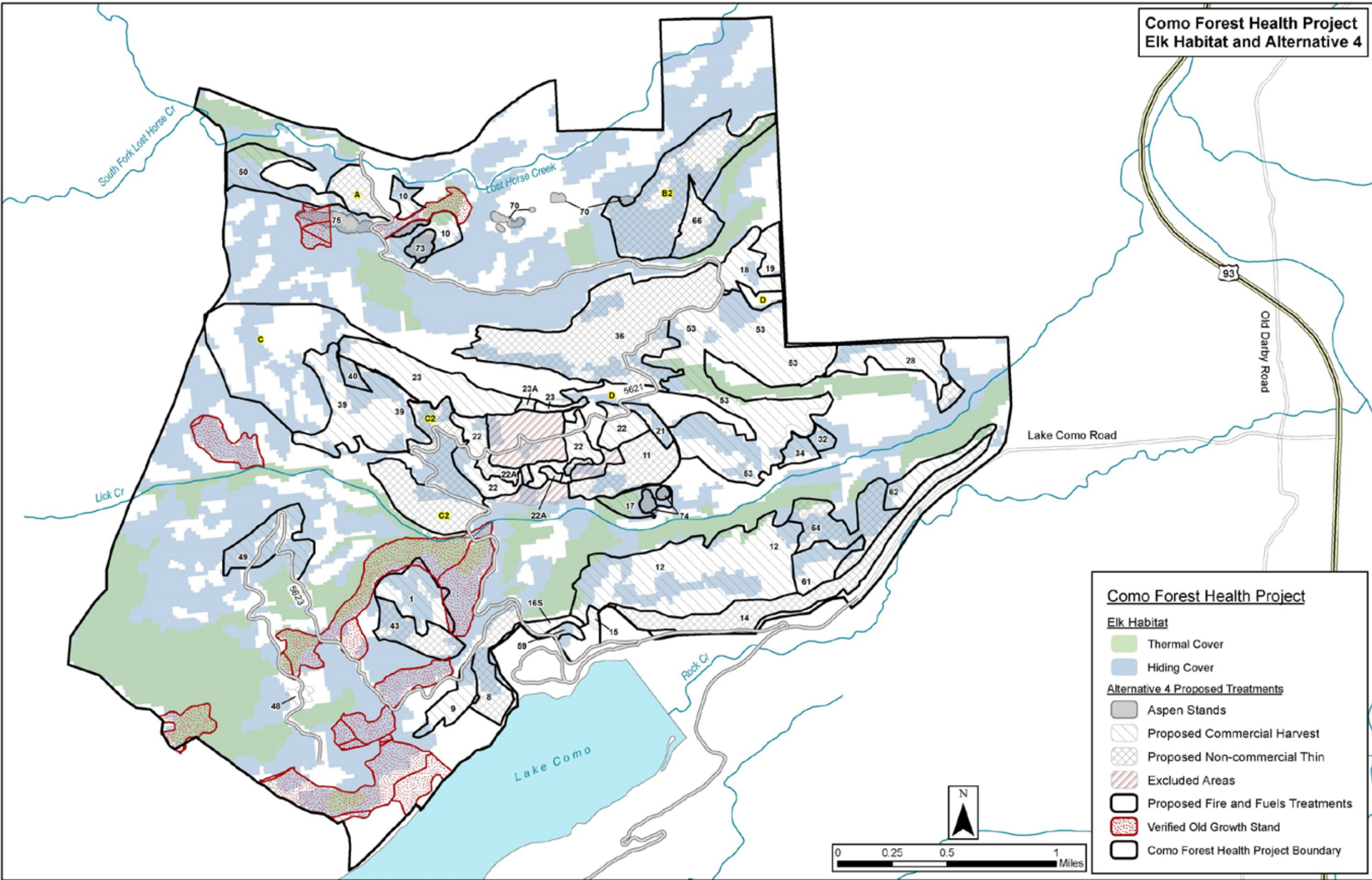


Figure 3.3- 29: Elk Thermal and Hiding Cover Outside of Alternative 4 Proposed Units

Table 3.3- 39: Summary of Effects on Elk Habitats Relative to Bitterroot National Forest Plan Standards.

COMPONENT	EXISTING CONDITION (ALT. 1)	ALT. 2	ALT. 3	ALTERNATIVE 4
Thermal Cover in Winter Range	Below standard; 12%	Below standard; <12%	Below standard; <12%	Below standard; 12%
Hiding Cover in Winter Range	Above suggested level; 53%	Above suggested level; 22%	Above suggested level; 27%	Above suggested level; 38%
Habitat Effectiveness	2 Third Order Drainages Below Standard	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
Security	Does not meet 30% recommendation in Trend Count Unit (22% of area)	Does not meet recommendation in Trend Count Unit (21% of area), removes 243 acres.	Does not meet recommendation in Trend Count Unit (21% of area), removes 237 acres.	Does not meet recommendation in Trend Count Unit (22% of area), removes 32 acres.

Thermal Cover

The Forest Plan standard that 25% of winter range habitat provides thermal cover cannot be met in the project area in any alternative because thermal cover occurs on only 12% of the winter range in the Como Forest Health project area. At the Elk Trend Unit scale, only 11% of the winter range provides thermal cover (Table 3.3- 39). Alternative 1 would not reduce thermal cover.

Alternatives 2 and 3 would further reduce thermal cover, and since the proposed activities would move the existing condition farther away from the standard in the Forest Plan ROD, these alternatives would require a site-specific Forest Plan amendment.

Alternative 4 would retain existing and potential thermal cover. Since Alternative 4 would not reduce thermal cover, it meets the intent of the standard in the Forest Plan ROD and does not require a site-specific Forest Plan amendment.

Elk Habitat Effectiveness

None of the alternatives, including Alternative 1, meet EHE standards in drainages 02a282-3 and 05d276-2. In Alternative 1, no roads would be closed and open road densities would remain as they are currently.

In Alternatives 2, and 4, no open roads would be closed and open road densities would not change. New roads proposed in Alternatives 2 and 4 would not affect the EHE standard because the system roads would be closed and the temporary roads and tracked line-machine trails would be rehabilitated as part of timber sale closure. Since Alternatives 2 and 4 would not move the project area farther from the EHE standards and because travel management is beyond the scope of this project, a site-specific Forest Plan amendment is not required.

Alternative 3 was developed in response to public comments opposed to the construction of new roads. Under this alternative new system road would not be constructed and temporary road and tracked line-machine trails would not be developed. Travel management would not change under Alternative 3 either. As in the other alternatives, Alternative 3 would not reduce EHE so it meets the intent of the Forest Plan ROD standard and a site-specific Forest Plan amendment is not required.

3.3.12.6 Summary of Effects

Implementation of Alternative 1 would not directly change elk populations or the quality of elk habitat within the project area or at larger scales over the short term. Over a longer time frame, thermal cover would continue to decline as canopy cover provided by lodgepole pine was reduced through mortality from mountain pine beetles. The amount of forested and open forage would decrease as Douglas-fir and subalpine fir increase, causing a reduction in grass and forb production. Hiding cover would increase as these shade-tolerant species grew in thicker stands. Thermal cover, hiding cover and forested forage would all continue to be at an increased risk of a stand-replacing fire due to the higher stand densities, decadence, and tree mortality. Elk habitat effectiveness and elk security will not be impacted with the implementation of this alternative.

The impacts of management activities proposed in Alternatives 2, 3 and 4 are analyzed in the Direct and Indirect Effects section, and are expected to have negative impacts to the quantity of thermal cover and hiding cover in both the short and moderate time frames. Forage productivity would probably increase in harvest units. Elk security area would decrease in the Lick Creek drainage, and EHE would not change in all drainages. Illegal off-road motorized use has the potential to increase, and will most likely continue to disturb elk in the area. These treatments would generally decrease the small amount of habitat diversity that is currently present in the Como Forest Health project area, and may result in a decrease in habitat quality in the longer term. Table 3.3- 39 summarizes the effects of the alternatives relative to Forest Plan standards.

3.3.13 Pileated Woodpecker (*Dryocopus pileatus*)

3.3.13.1 Overview of Issues Addressed

Habitat Quantity and Quality

Pileated woodpeckers in the northern Rocky Mountains inhabit mature and older forests dominated by cottonwood, western larch, ponderosa pine, and Douglas-fir at low to mid-elevations (Bull and Jackson 1995). Dead trees large enough to accommodate a nest cavity are important components of pileated woodpecker habitat (Terres 1980). While pileated woodpeckers are often associated with mature forests (Conner 1979, Conner 1980, Shackelford and Conner 1997), the presence of large trees or snags for nesting appears to be more important than forest age (Kirk and Naylor 1996, Giese and Cuthbert 2003). Pileated woodpeckers may do well in younger and fragmented forests that retain abundant older structure (Mellen et al. 1992). However, some studies have shown that pileated woodpeckers responded negatively to forest fragmentation, though whether older structure was retained in those studies is not clear (PF-WILD-053). Old growth forests are of particular importance to pileated woodpeckers.

Because of the reported association of pileated woodpeckers with large, dead trees, the availability of mature and older forest structure is important to pileated woodpecker population growth and persistence on a landscape. There are approximately 3,200 acres of suitable pileated woodpecker habitat and approximately 760 acres of potential pileated woodpecker habitat in the Como Forest Health project area.

Issue Indicators

Because pileated woodpeckers are habitat specialists, habitat quantity is used as an evaluation criterion to predict project effects. Limiting factors in pileated woodpecker habitat includes the availability of snags and trees for nest cavities and foraging. For each alternative, the following evaluation criteria are used to predict impacts on pileated woodpeckers:

- Stand structure, composition, and density of potential and suitable habitat, and

- “ Snag density of potential and suitable habitat.

3.3.13.2 Regulatory Framework

The regulatory framework that provides direction for the protection and management of pileated woodpeckers and their habitat comes from the NFMA and the Bitterroot National Forest Plan.

3.3.13.3 Affected Environment

Existing Condition

Legal and Management Status

Pileated woodpeckers are classified as a Montana Species of Concern. The Montana Natural Heritage Program and MTFWP rank the pileated woodpecker as a G5S3 species (MTFWP 2014). This means that at the global scale, pileated woodpeckers are considered common, widespread, and abundant, and not vulnerable in most of their range. At the state scale, they are potentially at risk because of limited or declining numbers, range and habitat, even though it may be abundant in some areas.

The Bitterroot Forest Plan identifies pileated woodpeckers as Management Indicator Species (MIS) to assure maintenance of viable population levels in old growth habitat due to their association with dead and defective tree habitat (PF-FPMON-002).

Local Habitat Status

Suitable habitat currently has the components and forest structure necessary to meet the needs of pileated woodpeckers, while potential habitat may not currently provide habitat but has the potential to develop into suitable habitat.

Wildlife queries of the FSVEG database indicate that the project area contains 3200 acres of suitable habitat and 761 acres of potential habitat. The suitable habitat is found throughout the project area in large, connected blocks (PF-WILD-054). All of the old growth stands within the project area are considered suitable habitat (Fig. 30). The areas of potential habitat are adjacent to suitable habitat.

With the exception of units 19, 51, 57, A, and E, all treatment units are located within suitable or potential pileated woodpecker habitat.

Local Population Status and Trends

Surveys for pileated woodpeckers on the Bitterroot National Forest have been performed annually since 1990. Forest records from 1990 to 1999 are incomplete; however, surveys have been documented annually along the southern boundary of the Como Forest Health project area, around Lake Como (PF-WILD-055). Survey protocols are described in PF-WILD-056.

At least one pileated woodpecker has consistently been heard every year along the Lake Como route, with a maximum count of 10 woodpeckers during the 2002 survey season. To compare monitoring results of each transect over a long-term scale, the number of pileated woodpeckers detected per mile of transect is calculated. Each year the number of pileated woodpeckers detected per mile on the Lake Como route was equal to or higher than the Forest-wide average number of pileated woodpeckers detected per mile (PF-WILD-055). The results of the annual surveys indicate that the population of pileated woodpeckers within the Como Forest Health Project area is persistent and relatively common.

Threats and Limiting Factors

Major threats to pileated woodpeckers are: (1) conversion of forest habitats to non-forest habitats; (2) short rotation, even-age forestry; (3) monoculture forestry; (4) forest fragmentation; and (5) removal of logging residue, downed wood, and pine straw that provides pileated woodpecker

foraging substrate (NatureServe 2014). Forest fragmentation not only changes habitat in the treatment areas but also changes habitat or habitat quality in the residual (untreated) forest (Wilcove 1990). Removal of logging residue, downed wood, and pine straw from forested areas not only removes forest nutrients and pileated woodpecker foraging structures, but also changes the water balance of the forest. The forest becomes drier and less suitable for the arthropod fauna the pileated woodpecker depends on (NatureServe 2014).

Other threats to pileated woodpeckers include deliberate killing by humans, toxic chemicals killing arthropod prey, and collisions with vehicles as individual birds approach or leave feeding sites (NatureServe 2014).

Standing snags and hollow trees are necessary habitat components for pileated woodpeckers. The removal of such structures from the project area would limit the presence of pileated woodpeckers in the area. The Como Forest Health project includes design features that maintain snag and coarse woody debris characteristics specific to the fire group of the unit.

Desired Condition

The desired condition for pileated woodpeckers in the Como Forest Health project area would provide habitat that supports a viable population and maintains old growth habitat that supports viable populations of old growth associated species as described by the regulatory framework.

3.3.13.4 Environmental Consequences

Methodology

For each alternative, the following evaluation criteria were used to predict impacts on pileated woodpeckers and their habitat:

- “ Stand structure, composition, and density of potential and suitable habitat, and
- “ Snag density in potential and suitable habitat.

Suitable and potential habitats in the Como Forest Health Project area were mapped through a query of the TSMRS/FACTS database. Vegetation and physical data were collected for many of these stands in 2013. Some plot data is older, but still valid.

Suitable habitat was delineated as ponderosa pine or Douglas-fir within habitat type groups A, B, C, and G that is in a mature seral stage (mature, saw timber, multi-storied (with two or three levels) or old growth habitat) below 6200 feet in elevation (PF-WILD-057).

Potential habitat was delineated as ponderosa pine or Douglas-fir within habitat type groups A, B, C, and G that is in a young seral stage (seedling, sapling, and pole) below 6200 feet in elevation.

Snag density was qualitatively analyzed relative to each alternative (Snag section).

Spatial and Temporal Context for Effects Analysis

Spatial Context

The defined effects area for pileated woodpeckers is the Como Forest Health Project area and adjacent third-order drainages up to 6,200 feet in elevation (Figure 3.3- 30). This cumulative effects analysis area incorporates 15,000 acres of low elevation, forested land. The estimated size of pileated woodpecker territory in western Montana ranges between 500 – 1000 acres (McClelland 1977). Therefore, this analysis area is appropriate to analyze the incremental effects of the project activities on pileated woodpeckers directly, indirectly or cumulatively because it provides a large area of contiguous suitable or potentially suitable habitat that could support several pileated woodpecker territories without diluting the project effects.

An assessment of information available at the statewide level is also considered to provide additional context for cumulative effects.

Temporal Context

The effects of the actions in Alternatives 2, 3, and 4 on suitable and potential habitat would last until the modified stand components recover and function as suitable pileated woodpecker habitat.

Broader Context and Trends

Pileated woodpecker population information on the Bitterroot National Forest is based on long-term monitoring transects reported in Forest Plan Monitoring Reports (PF-FPMON-038). The information is not sufficient to establish population densities or trends, but the number of pileated woodpeckers detected per mile of transect has generally increased since 2000. Pileated woodpeckers appear to be common and well distributed at low to mid-elevations across the Forest as indicated by frequent detections of their unique foraging excavations and calls.

Most of the Forest's recent management activities in lower elevation forests emphasize restoration of mature ponderosa pine habitats, which should benefit pileated woodpeckers (PF-FPMON-038).

Snag retention guidelines in place since the 1980s have reduced the loss of potential pileated woodpecker nesting snags in harvest units on the Bitterroot National Forest. Monitoring of recent vegetation management activities (PF-WILD-058; PF-WILD-059) indicates prescriptions for snag retention have been met consistently. Samson (2005, p. 60) stated that timber management in the Northern Region in 2004 amounted in total to 0.0009% of the landscape, and is not affecting short-term species viability.

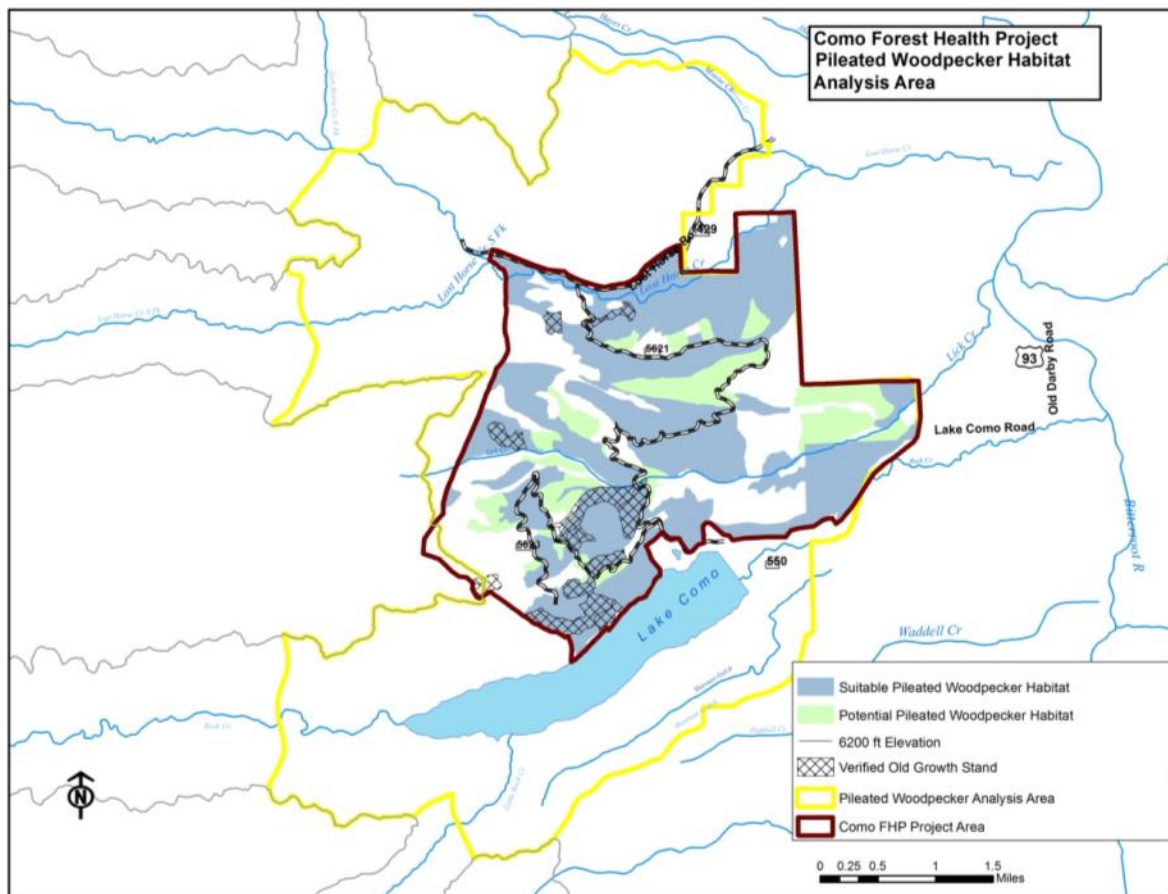


Figure 3.3- 30: Analysis Area for Pileated Woodpeckers in the Como Forest Health Project

Regional habitat models using FIA data estimate that the Bitterroot National Forest contains sufficient suitable nesting habitat to support about 91 pairs of pileated woodpeckers, and enough winter foraging habitat to sustain almost 800 pairs of this species (Samson 2005). This habitat is well distributed across the Bitterroot National Forest at lower to mid-elevations. Habitat estimates only include National Forest System lands. National Forest alone provides 86% of the habitat necessary for a minimum viable population, which is estimated to be 180 individuals (Samson 2006).

Additional nesting habitat for pileated woodpeckers is located on private lands in the mixed cottonwood and ponderosa pine forests along the Bitterroot River and many of its larger tributaries. These bottomland forests provide some of the most productive pileated woodpecker habitat and connect subpopulations in the surrounding mountains. The presence of large amounts of high quality habitat on private land indicates that the Bitterroot drainage is capable of supporting a much larger population of pileated woodpeckers than indicated by estimates of the Bitterroot National Forest alone.

At the Regional scale, habitat modeling estimates there is enough suitable nesting habitat to support about 2,362 pairs of pileated woodpeckers, and enough winter foraging habitat to sustain about 19,430 pairs (Samson 2005). Again, this estimate does not include the high quality habitat located along the river and stream corridors on private land. Median dispersal distance for pileated woodpeckers is about 150 miles, which indicates that pileated woodpeckers across the entire Region belong to a single, well-connected population. The National Forests neighboring the Bitterroot National Forest to the north and west have pileated woodpecker habitat in excess of the quantity modeled to maintain a minimum viable population on their Forests (Lolo -165%, Clearwater -346% and Nez Perce -459%). Samson (2005) concluded that habitat estimates for the pileated woodpecker based on the Regional nest tree habitat model show nest site habitat is abundant and well distributed across the Northern Region by National Forest, and that habitat on today's landscape is very abundant for the pileated woodpecker (Ibid).

Although no population estimates are available, the large amount of apparently suitable habitat well distributed across the Region combined with the interconnectedness of the population indicates that pileated woodpecker populations are viable in the short-term across the Region (Samson 2005).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Previous timber harvest on Bitterroot National Forest in the limited amount of suitable pileated woodpecker habitat, relative to adjacent forests, removed many of the large ponderosa pines and large snags. The loss of large trees and snags in these areas undoubtedly reduced the number of pileated woodpeckers the Forest could support. Firewood cutting near the road system has also removed some of the large snags that may have provided pileated woodpecker nesting or foraging habitat.

Most of the forested area along the foothills of the Bitterroot Mountains adjacent to the Como Forest Health project area probably provided good habitat for pileated woodpeckers prior to historic logging, but these areas have been harvested repeatedly. Much of the historic forest dominated by mature ponderosa pine has been removed, and the remaining forest structure is composed mostly of second-growth mixed ponderosa pine and Douglas-fir. Large old trees and large snags are relatively rare components of this area. The habitat quality for pileated woodpeckers throughout this area is generally poor, although there may be areas that provide suitable nesting habitat that may be occupied by woodpeckers. The lack of high-quality habitat implies that much of the project area is probably unoccupied by pileated woodpeckers at this point. As a result, this area probably supports lower numbers of pileated woodpeckers than areas with better quality habitat.

Pileated woodpeckers may be vulnerable to the repeated action of fire suppression, which modifies forest structure and composition (PF-FPMON-038). Fire suppression has allowed Douglas-fir and other shade-tolerant tree species to encroach coniferous forests historically dominated or co-dominated by ponderosa pine or western larch over the past 80 years or more. In the Como Forest Health Project area, Douglas-fir has changed the composition and structure of stands by out-competing the shade-intolerant species such as ponderosa pine. This has led to a loss or reduction of preferred nest tree species.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the No Action alternative.

Indirect Effects

Alternative 1 would not change existing pileated woodpecker habitat quality. In the short term, habitat quality would continue to improve at both lower and mid-elevations as forests continue to mature, snag numbers increase because of insect and disease-caused mortality, and coarse woody debris accumulates. These processes would increase the amount of large snags and coarse woody debris, which would provide more pileated woodpecker nesting and foraging habitat. In the longer term, increasing tree densities and fuel loads would increase the probability of a large, severe fire. A large fire would create unsuitable habitat for pileated woodpeckers in areas that burned with moderate or high intensities. Pileated woodpeckers are not strongly associated with recently burned landscapes as are many woodpecker species (Hutto 1995), and do not commonly nest in areas of recent stand replacing fire (Smith 2000).

Cumulative Effects

As wildfires would generally continue to be suppressed in the Como Forest Health project area, there would be little potential for the development of the more open old growth stands with large diameter ponderosa pine, the preferred pileated woodpecker nesting and foraging habitat. Encroachment and growth in the understory would continue until a large-scale, high severity fire occurred. The loss of the large ponderosa pine, through either encroachment or fire, would reduce the availability of pileated woodpeckers nesting habitat for a period of 100 years or more.

Along open roads, large snags would continue to be cut by firewood cutters, but snags would remain abundant in many portions of the project area that are not accessible by open roads.

Alternatives 2, 3, and 4

Design Features and Mitigation Measures

Design features are incorporated into Alternatives 2, 3, and 4 to ensure that snag habitat is retained and maintained at historic levels by specific fire groups (Table 2.2-5). This design feature will maintain or increase pileated woodpecker habitat. Monitoring reports and field notes from previous projects done on the Bitterroot National Forest substantiate the effectiveness of these features (PF-FPMON-038).

Direct and Indirect Effects

Fifty-five and 56% of the suitable habitat within the project area would be treated in Alternatives 2 and 3, respectively; Alternative 4 treats 38% of the suitable habitat. The habitat outside of the treatment units is mostly in two large, continuous areas, which would continue to be functional woodpecker habitat after treatment (Figure 3.3- 31, Figure 3.3- 32, and Figure 3.3- 33). The alternatives would also treat about half of the potential pileated woodpecker habitat in the project area with Alternative 2 treating 76 to 108 acres more than Alternatives 3 and 4, respectively (Table 3.3- 40). Between 300-400 acres of untreated potential woodpecker habitat would remain in

fragments across the project area. While the treatment of the potential habitat would not affect woodpeckers directly, it will prolong the development of suitable pileated woodpecker habitat. Snags and coarse woody debris would be retained according to the retention guidelines to ensure some potential nesting and foraging habitat would remain in the units.

Table 3.3- 40: Suitable and Potential Pileated Woodpecker Habitat Treated in Alternatives 2, 3, and 4

TREATMENT	SUITABLE HABITAT (ACRES)			POTENTIAL HABITAT (ACRES)		
	ALT 2	ALT 3	ALT 4	ALT 2	ALT 3	ALT 4
Existing Condition	3,200			761		
Commercial Treatment	796	758	530	172	102	161
Fire Rx Only	663	458	156	130	61	2
Non-commercial Thinning	303	581	503	163	223	194
Aspen treatments	NA	NA	39	NA	NA	NA
Total Habitat Treated	1,762	1797	1228	465	386	357
Treated Habitat (%)	55	56	38	61	51	47

The commercial harvest treatments in suitable pileated woodpecker habitat would reduce the amount of nesting and foraging habitat. However, the treatments are designed to maintain snags and reduce encroachment of shade-tolerant trees, which would improve woodpecker habitat in the long term. In the short term, foraging structures would be removed for sanitation/salvage and fuel reduction purposes. Removing these materials also removes forest nutrients and pileated woodpecker foraging substrates, making the forest a drier environment less suitable for the arthropod fauna the pileated woodpecker depends on (NatureServe 2014). Nesting habitat would be reduced for both sanitation and safety reasons, although treatment design features would retain adequate quantities of snags. Average pileated woodpecker territory size would likely increase because the proposed treatments would reduce habitat quality in some territories. As a result, the pileated woodpecker carrying capacity in the project area could be less than the existing condition.

The commercial harvest proposed in the alternatives would move treated stands towards mature or old growth conditions in the long term by reducing high stocking densities and retaining large diameter trees. The reduced stocking in the treated stands would release the remaining trees from competition for water and nutrients. Reduced stocking levels also decreases fuel loads, which would lower fire severity in the event of a fire.

Research units (Units 11, 22, 22A, 23, and 23A) will be treated in Alternatives 3 and 4 (Figure 3.3- 32 and Figure 3.3- 33). These units are in suitable pileated woodpecker habitat. The treatment effects will be to the same as the effects of commercial harvest in ponderosa pine units.

Fuels in the prescribed fire units would not be treated prior to ignition in Alternative 2. The fuels in Units A, B2, C2, and E2 would be pre-treated in Alternative 3, and all prescribe fire units in Alternative 4 would have fuels treatments before ignition except Units C and D. Units C and D are within their historic fire return intervals and fuel loads are appropriate for their fire groups. Pre-treatment of fuels in units with fuels in excess of historic levels would keep the burn severity within the prescribed low to moderate parameters. Low severity fires would improve pileated woodpecker habitat by reducing encroachment of shade tolerant conifers and maintaining snags and large, decaying trees necessary for pileated woodpecker habitat. Prescribed fire units B and E would not be burned in Alternative 4.

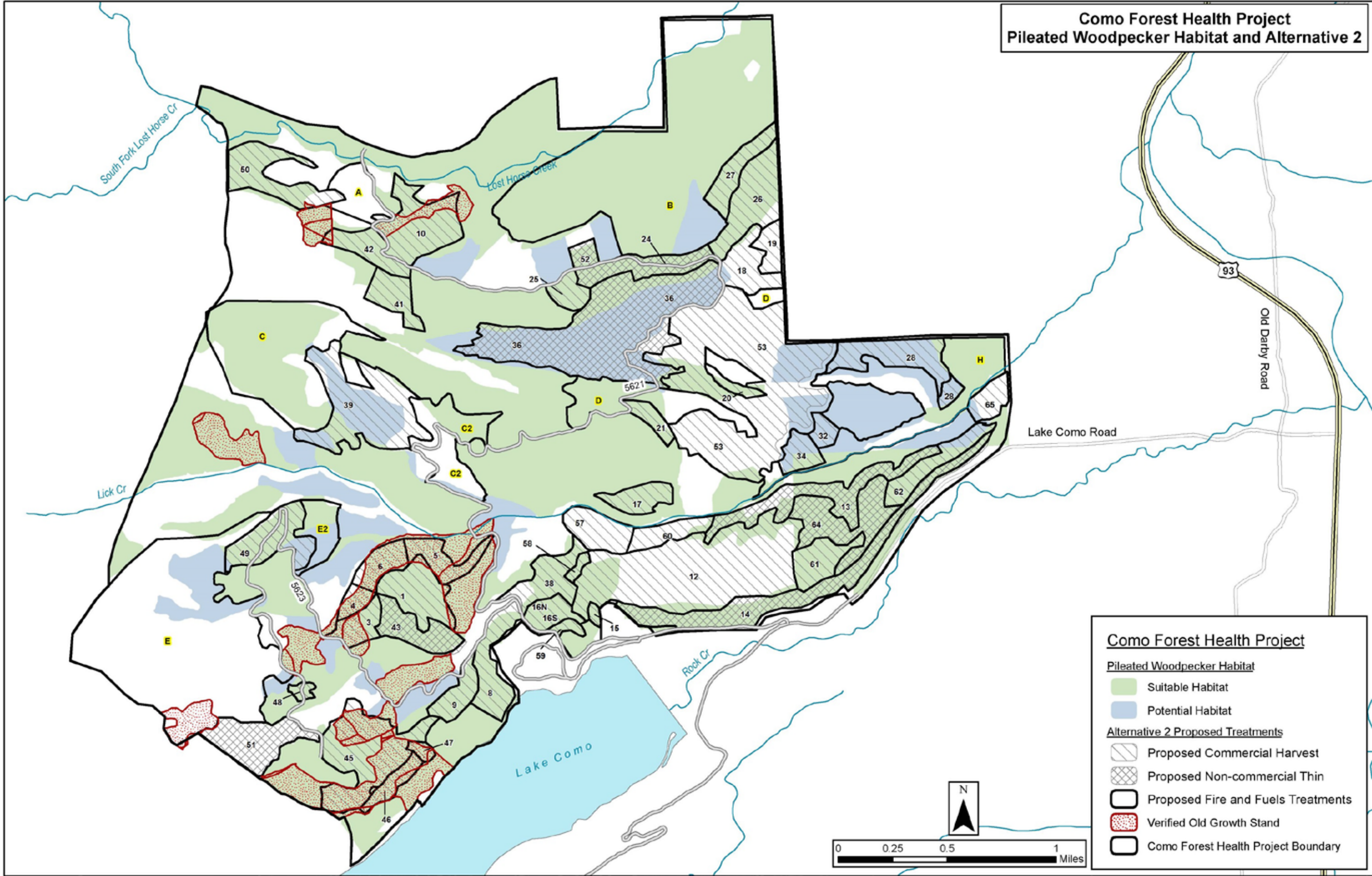


Figure 3.3- 31: Suitable and Potential Pileated Woodpecker Habitat outside of Alternative 2 Proposed Treatment Units

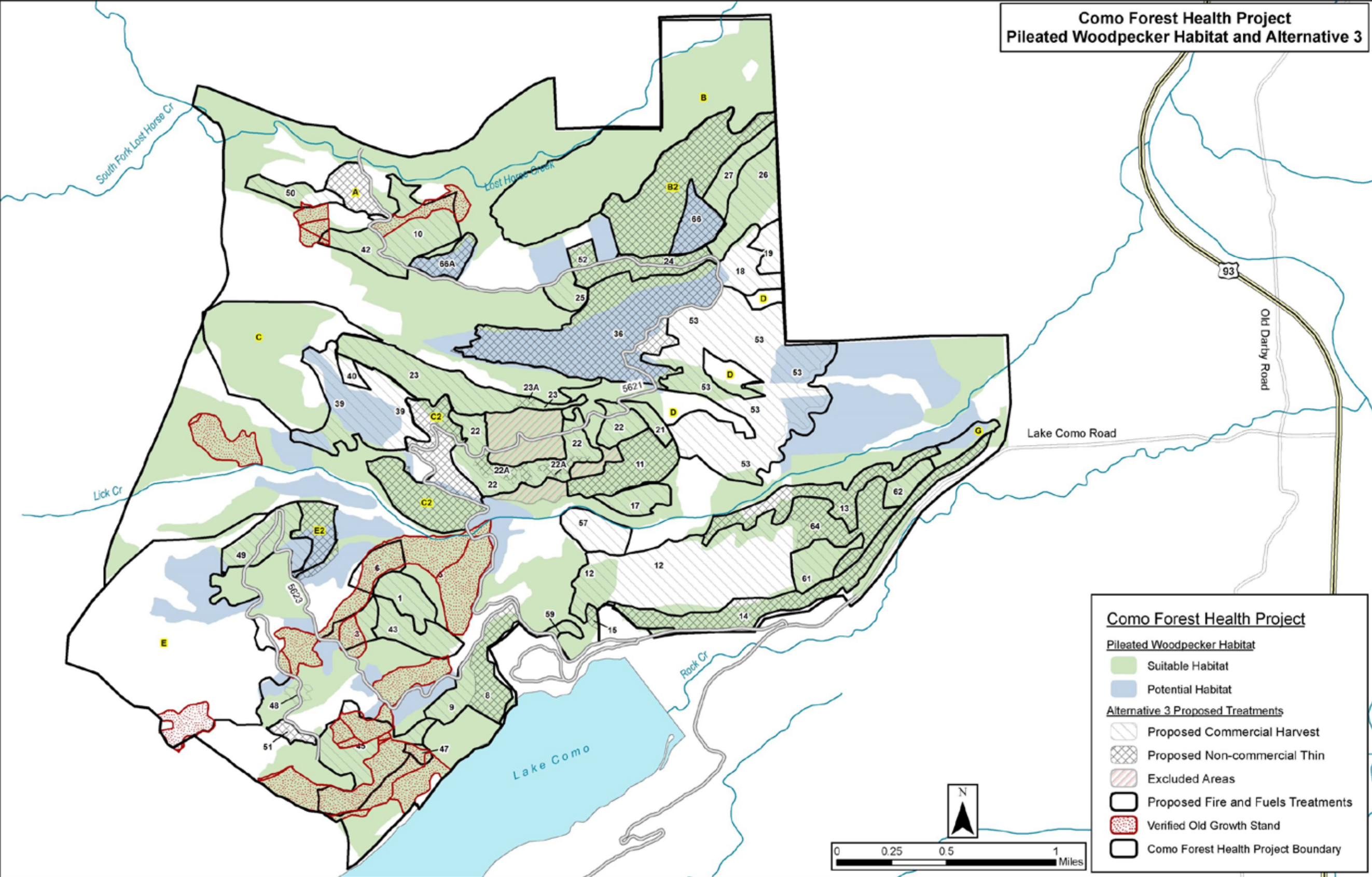


Figure 3.3- 32: Suitable and Potential Pileated Woodpecker Habitat outside of Alternative 3 Proposed Treatment Units

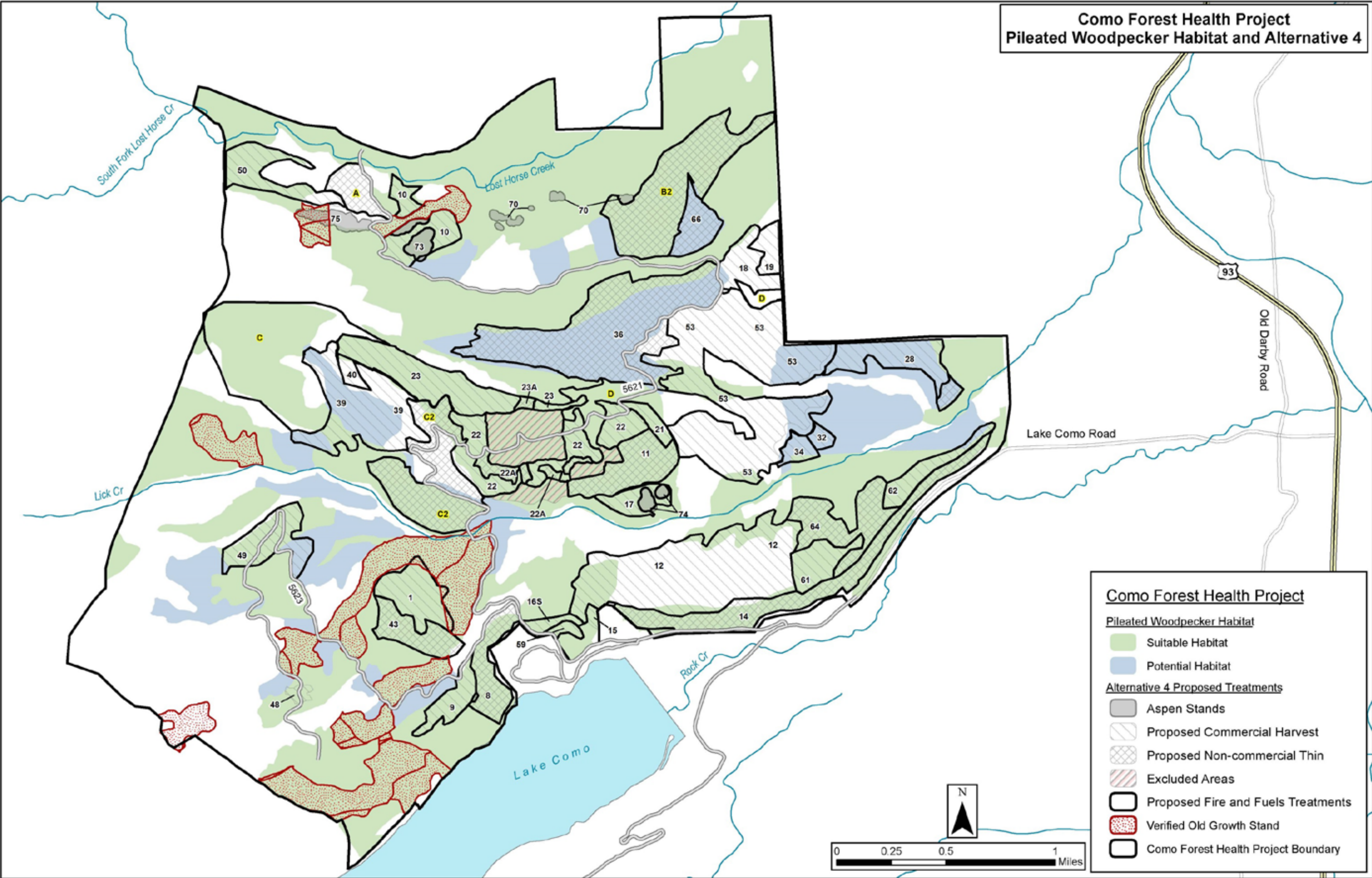


Figure 3.3- 33: Suitable and Potential Pileated Woodpecker Habitat outside of Alternative 4 Proposed Treatment Units

Prescribed fires that burn at moderate to high severity could reduce the quality of pileated woodpecker nesting habitat by eliminating some of the large snags preferred for nesting. These snags can burn even during low severity underburns. Once a snag is on fire, it will often burn through and fall. The loss of snags is especially likely to occur in old growth units where fuels have accumulated because fire suppression has extended the fire return interval, and in units where excess fuels would not be treated before the prescribed fire is ignited.

The prescribed fire units generally contain abundant large, live ponderosa pine and large snags; key pileated woodpecker habitat components. However, within the commercial treatment units, there are a minimal number of snags within most of the units (See Snag report). Prescribed fire can create new snags if they generate sufficient heat around green trees, and some of these new snags may be large enough to accommodate pileated woodpecker nesting. Overall, the effects of prescribed fire on pileated woodpecker nesting habitat would likely be neutral to negative in the short term because the prescribed fires are likely to burn more snags than they create. Prescribed fire is proposed throughout the larger blocks identified as pileated woodpecker nesting habitat.

Prescribed fire could also reduce the quality of pileated woodpecker foraging habitat by burning decayed logs and stumps that provide habitat for carpenter ants. An Oregon study showed that pileated woodpeckers foraged significantly less in units that had been burned using prescribed fire, because these units contained less dead wood habitat for ants, the primary prey species of pileated woodpeckers (Bull et al. 2005). In the short term, the effects of prescribed fire on pileated woodpecker foraging habitat would be negative. These effects would also apply to post-treatment prescribed fire proposed for most of the commercial timber units.

Old growth units 3, 4, 5, 6, 10, 45, 46, 47 (240 acres) would be treated in Alternative 2 and units 3, 6, 10, 45, 47 (192 acres) would be treated in Alternative 3. Treatments proposed in the units would move them farther away from desired pileated woodpecker habitat conditions in the long term by decreasing the canopy cover, reducing the amount of decaying woody debris on the forest floor, and most likely killing large, mature ponderosa during burning treatments. Although pileated woodpeckers require dead, mature ponderosa pines, fire-created snags tend to decay differently than trees infected with disease or insects and may not be an equal replacement of the mature trees that would be lost during burning. Snags that present safety hazards to loggers would be removed, which would reduce snag density in the short-term. However, snag retention guidelines would retain an adequate amount of snags within these units, in addition to the snags outside of treatment units. Overall, snag density would be reduced, which would reduce the amount of available pileated woodpecker nesting and foraging habitat (Snag and Old Growth sections).

Overall, treatments in old growth forest in Alternatives 2 and 3 would have negative effects on pileated woodpeckers and their habitat. The treatments could reduce the number of large snags available for nesting and foraging and break-up habitat connectivity in the project area.

Old growth units would not be treated in Alternative 4 and would continue to provide pileated woodpecker habitat. These units would also continue to be at risk for a high severity fire, if an ignition occurred. However, treatments in surrounding units would modify fire behavior so the risk would not be as high as in Alternative 1 (Old Growth section). Units that are close to reaching old growth status would also not be treated and would be recruitment stands, providing future pileated woodpecker habitat.

Cumulative Effects

The impacts of management activities proposed in Alternatives 2, 3, and 4 are analyzed in the Direct and Indirect Effects section.

Pileated woodpeckers may be vulnerable to continued fire suppression, which modifies forest structure and composition over time (PF-FPMON-038). Over the past 100 years or so, fire suppression in coniferous forest historically dominated by ponderosa pine has increased the prevalence of shade-tolerant tree species. In the Como Forest Health project area, Douglas-fir has changed the composition and structure of stands by out-competing the shade-intolerant ponderosa pine. This has led to a loss of preferred nest tree species. Fire suppression will continue in the Como Forest Health project area, and shade-tolerant tree encroachment will continue, making the habitat less suitable for pileated woodpecker nesting. Dense stands are more susceptible to severe fires that result in large areas of stand replacing disturbance where, historically, low or mixed severity fires occurred.

3.3.13.5 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

National Forest Management Act of 1976

Alternatives 1, 2, 3, and 4 would be consistent with NFMA direction for diversity of plant and animal communities and ecological sustainability. A comparison of habitat required for a minimum viable population of pileated woodpeckers to that available indicates well-distributed habitat far exceeds that needed across the Region, given the natural distribution of species and their habitats as mapped by the Montana Natural Heritage Program, Idaho Birdnet, and NatureServe. While other factors outside of Forest Service control (such as global climate change, fire suppression activities on private lands, or conversion/subdivision of private forest) may have negative effects on pileated woodpeckers, Alternative 1 would not add to these effects and Alternatives 2, 3, and 4 would not substantially add to them. Therefore, Alternatives 1, 2, 3, and 4 would not likely result in a trend toward federal listing or reduced viability for the population or species.

Forest Plan

The Bitterroot Forest Plan Monitoring Report (PF-FPMON-038) summarizes pileated woodpecker population monitoring efforts. Evidence from this monitoring report indicates pileated woodpeckers are well distributed across the Forest.

Alternative 1 will not reduce the amount of old growth habitat in the project area in the short term, because no timber harvest or prescribed fire would occur. Alternatives 2 and 3 propose treatments in ponderosa pine old growth units. **Silvicultural objectives would be to keep the essential characteristics of old growth forests, however, the implementation of these treatments has not been well tested and their outcomes are uncertain, especially in the mixed conifer old growth units (Silviculture section p. 45, 47). If the old growth units do not retain their old growth characteristics following treatment, Alternatives 2 and 3 would not meet the Forest-wide standard that states:**

Old-growth stands may be logged and regenerated when other stands have achieved old-growth status (USDA Forest Service 1987: p. II-20)

Alternative 4 does not propose treatments in old growth units and therefore meets the intent of the Forest Plan standards.

The Forest Plan Record of Decision (p. 6) considered and permits salvage of dead or dying trees (PF-FPMON-002). The Forest Plan FEIS (Volume I, p. III-33, IV-22) specifically discussed the concern of stand replacing fires following mortality from insect epidemics and due to fire suppression (PF-FPMON-002). Salvage is also discussed in multiple areas of the Forest Plan and Record of Decision (PF-FPMON-002; PF-WILD-019), further supporting that the removal of snags, beyond what is necessary for safety, was not only intended but was programmed (FP p. II-20(6), II-20(2), II-22(2), III-8, III-14, III-21, III-29, and III-35). Alternatives 2, 3, and 4 are consistent with the Forest Plan because

the snag retention guidelines described in Chapter 2 meet the intent of the Plan to provide vertical structure and maintain species viability while allowing salvage and fuel reduction activities. No snags will be removed in the Como Forest Health Project area under Alternative 1.

3.3.13.6 Summary of Effects

Implementation of Alternative 1 would have no impact on the pileated woodpeckers or their habitat.

Implementation of Alternatives 2, and 3 would have short-term negative impacts on pileated woodpecker nesting and foraging habitat, and could reduce the pileated woodpecker carrying capacity in the project. Treatments within pileated woodpecker habitat would reduce the risk of stand-replacing fire, and would improve stand composition and structure in the longer term by increasing tree spacing and reducing fuels and the prevalence of Douglas-fir. This would improve future pileated woodpecker habitat quality.

Implementation of Alternative 4 would have minor short-term negative impacts on pileated woodpecker nesting and foraging habitat, but would not reduce pileated woodpecker carrying capacity in the project area. Treatments within pileated woodpecker habitat would reduce the risk of stand-replacing fire, and would improve stand composition and structure as described for Alternatives 2 and 3. This would also improve future pileated woodpecker habitat quality.

3.3.14 Forest Land Birds

3.3.14.1 Overview of Issues Addressed

Habitat Quantity and Quality

Forest land birds include all avian species in our area, except waterfowl and game birds. The Forest Service land bird monitoring program indicates there are more than 100 species of land birds on the Bitterroot National Forest. Forest land birds occupy every habitat type that is present in the Como Forest Health project area, and any treatment, including no action, will positively affect some species at the expense of others. It would be impractical to treat all individual land bird species separately. However, individual land bird species' habitats are represented by other species discussed in the analysis, e.g. dry site species are represented by flammulated owls; early seral stage species by lynx; old growth associates by flammulated owl, pileated woodpecker, fisher and marten; and snag dependent species by black-backed and pileated woodpeckers. Maintaining or trending habitats toward their historical conditions would provide the range of land bird habitats the birds evolved with and are adapted to on the Bitterroot National Forest.

Issue Indicators

Because land birds occupy every habitat type within the project area, general changes to forest structure were used to evaluate and predict project effects.

Forest land birds are protected by the Migratory Bird Treaty Act of 1918, which is explained in the beginning of this section. The Bitterroot Forest Plan provides guidance on the protection and management of Forest Land Birds, requiring that habitat is provided to support viable populations of native and desirable non-native wildlife, and to maintain habitat for the recovery of threatened and endangered species (USDA Forest Service 1987:II-3).

3.3.14.2 Affected Environment

Existing Condition

Legal and Management Status

There are more than 100 species of land birds on the Bitterroot National Forest according to our land bird monitoring results. No land birds are listed as endangered on the Bitterroot National Forest; however the yellow-billed cuckoo (*Coccyzus americanus*) is listed as threatened. Bald eagles, black-backed woodpeckers, flammulated owls and peregrine falcons are listed as sensitive. Two species, willow flycatcher (*Empidonax traillii*) and olive-sided flycatcher (*Contopus cooperi*), are listed as species at risk in Quigley and Arbelibide (1997).

Local Habitat Status

Forest land birds occupy every habitat type that is present within the Como Forest Health project area.

Local Population Status and Trends

The Bitterroot National Forest has operated two Monitoring Avian Productivity and Survivorship (MAPS) banding stations (following the nation-wide protocols established by the Institute for Bird Populations). The stations have been in operation since 1993 and are both located near Lake Como. The Lick Creek banding station is located within the project area between NFSR 5621 and unit 38. There are no proposed activities in a .10 mile radius of the banding station, which is a sufficient distance to ensure that the community of breeding birds that are sampled at the station is not altered by substantial habitat changes. The second banding station, the Rock Creek station, is located downstream of Lake Como, outside of the project area.

MAPS is a cooperative effort among public agencies, private organizations, and the bird banders of the continental United States, Canada, and Mexico to provide critical, long-term data on population and demographic parameters for over 100 target landbird species at multiple spatial scales. The program utilizes standardized, constant-effort mist netting and banding during the breeding season at an extensive network of stations. The MAPS methodology provides annual indices of adult population size and post-fledging productivity from data on the numbers and proportions of young and adult birds captured; and annual estimates of adult survivorship, adult population size, proportion of resident individuals in the adult population, recruitment into the adult population, and population growth rate from mark-recapture data on adult birds. A full description of MAPS methodology and protocols can be found in the project file (PF-WILD-060).

A full list of species caught at each station over the past 20 years is located in the project file (PF-WILD-061). The total number of birds caught at each station for each year that the station has been run can be seen in (Figure 3.3-34 and Figure 3.3-35). The data is a little skewed because the Forest banded for 10 banding periods (a 10-day period) each year in 1993-1995 and nine banding periods in 1996, but has since changed to now operating for only seven banding periods. Therefore, the early years have more total captures and a few species that are rarely caught anymore because the additional three banding periods were occurring during the migration period. Also, the numbers for some species (like Chipping Sparrows) may have declined simply because a couple of the nets that used to be on the drier sites they prefer were moved down into the creek bottom.

The Bitterroot National Forest has monitored land bird populations and their cycles for over twenty years. The total number of birds handled (the number of birds caught in nets that either are banded or remain unbanded) cycles through the years. There was an obvious dip in total numbers captured in the 2001-2004 period, and a high between 2007 and 2010. The numbers of migratory species have been fairly consistent (although they vary from year to year), but numbers of resident species seem to have generally declined over time. The project biologist is not sure why this should be, but

one possible reason for this decline could be from a response due to habitat changes, or simply because the resident birds have figured out the net locations better than the migrants have. For instance, red-breasted nuthatches (resident species) are heard in the banding area almost every time the station is operated, but the numbers of nuthatches captured have declined. This is the same with other resident species such as golden-crowned kinglets and dark-eyed juncos.

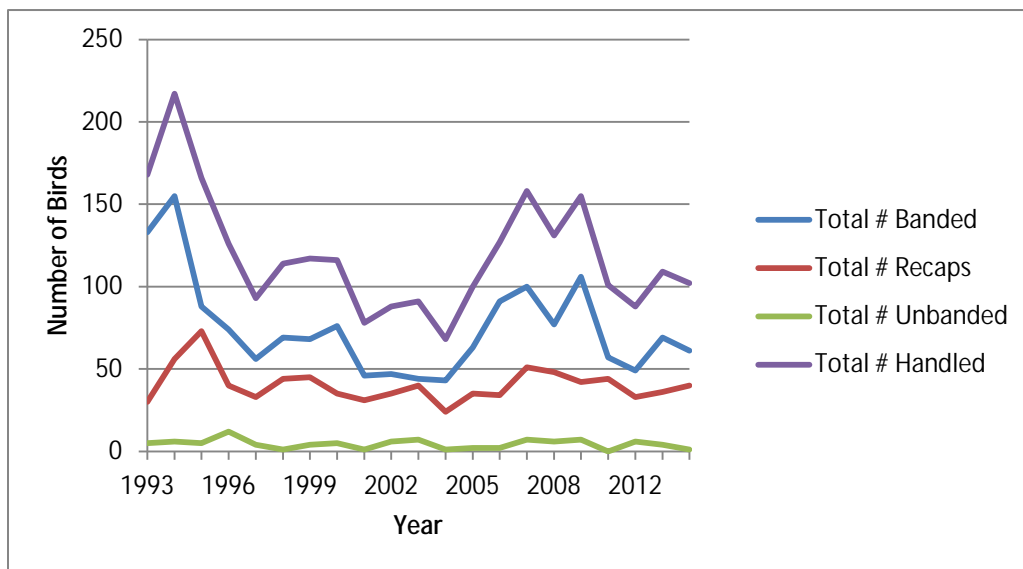


Figure 3.3-34: Summary of MAPS data collected at Lick Creek, 1993 - 2014.

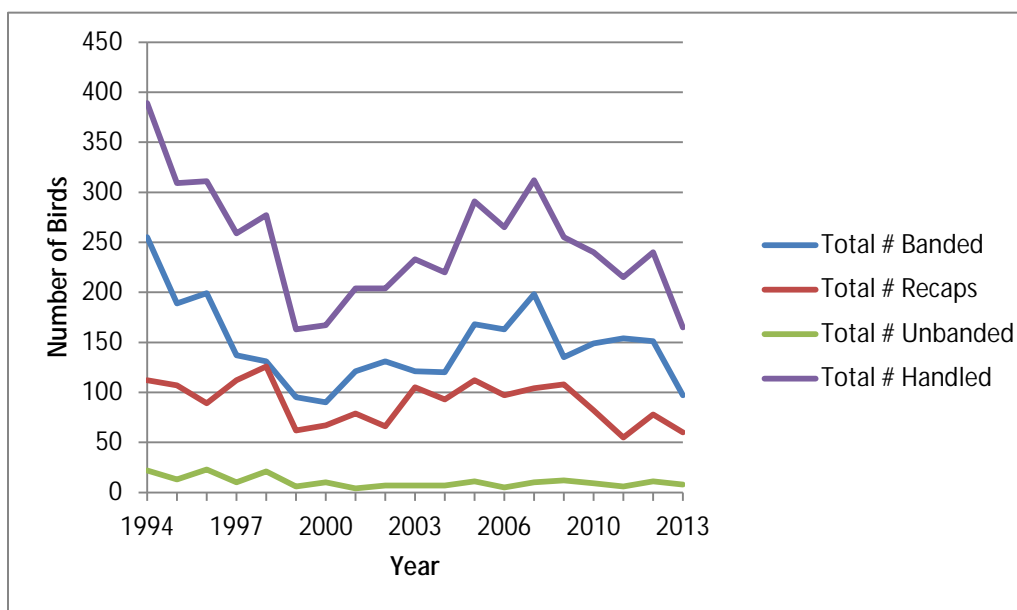


Figure 3.3-35: Summary of MAPS data collected at Rock Creek, 1993 - 2013.

Northern goshawks (*Accipiter gentilis*) were removed from the Northern Region's Regional Forester's sensitive species list in 2007. However, because they were on the list up to 2007, a considerable amount of data about their occupancy and reproductive status was collected on the Bitterroot National Forest. Within the project area, a goshawk territory was identified near Unit 5 in 1998. The territory includes three separate nests, which have been monitored for the past 15 years. The last

year the territory was active with goshawks was in 2008, when reproduction efforts failed (Table 3.3-41). The territory has not been actively used since.

Forest personnel also participate in and monitor citizen land bird monitoring efforts, such as the nationwide Christmas Bird Counts and the Migratory Bird Count. The objective of the Migratory Bird Count is to provide a nation-wide snapshot of the progress of migration on the second Saturday in May of each year. None of the ongoing monitoring has raised concerns about declines of any species.

Table 3.3- 41: Occupancy and reproductive success of northern goshawk territory within project area.

Nest Number	Year Found	Nest Status															
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
04 A	1998	1 ^a	N	2	N	3	2	N	0	N	N	N	N	N	N	N	N
04 B	2004	-	-	-	-	-	-	F	N	2	N	F	N	N	N	N	N
04 C	2007	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N
^a 1, 2, 3 = number of young fledged; N = Not active, nest monitored; F = Nest failed after determined to be active																	

Threats and Limiting Factors

Major threats to U.S. forests, and therefore the land birds living in them, include urban and ex-urban development, changes in natural disturbance regimes including fire, and exotic insect pests and diseases.

Neotropical migrants require habitat conservation throughout their international ranges and conservation practices are need in Latin America and the Caribbean to ensure these birds return to the U.S. in spring. For example, Bicknell's thrush, a breeding bird of Northeastern mountains, needs immediate action to stop deforestation in Hispaniola. Virginia's warbler and rufous hummingbird both breed in the West and winter in Mexican pine-oak and thorn forests.

Habitat loss is by far the greatest cause of bird population declines. Humans also kill billions of birds in the U.S. annually through more direct actions, such as allowing outdoor cats to prey upon birds. Pesticide use and collisions with windows, cars, communication towers and wind turbines are also sources of high bird mortality and contribute to population decline (North American Bird Conservation Initiative 2014).

Desired Condition

The desired condition for forest land birds within the Como Forest Health project area is to provide and maintain habitat that supports a viable population of forest land birds and prevents a population declines as described by the regulatory framework.

3.3.14.3 Environmental Consequences

Methodology

Changes to forest structure were used as an evaluation criterion for project effects. These changes were predicted based upon silvicultural prescriptions and previous timber harvest projects.

Spatial Context for Effects Analysis

The defined effects area for forest land birds is the Como Forest Health project area of 5,711 acres. Effects of this project on land birds would not be measurable outside of the analysis area due to the array of bird species categorized as “forest land birds” and the diversity of forest structures used by these birds.

Temporal Context for Effects Analysis

The effects of the actions in Alternatives 2, 3, and 4 would last until the forest stands returned to the seral stage at which they are currently. Depending on the current stage of a stand, this timeframe could range from 10 years to 100+ years.

Broader Context and Trends

The Northern Region Forest Land Bird monitoring program monitors land bird population trends. Since inception of the program in 1994, more than 20 permanently marked point-count transects have been established on the Bitterroot National Forest. Other land bird monitoring efforts include five Breeding Bird Survey routes (following the protocols established for a nation-wide network by the U. S. Fish and Wildlife Service).

The State of The Birds report (2014), states the western forests indicator has declined nearly 20% and continues to decline since 2009. The western forests indicator is based on 39 obligate breeding species. More than half of western forests are on public lands (North American Bird Conservation Initiative 2014). Species dependent on oak and pinyon-juniper woodlands, such as the oak titmouse and pinyon jay, show the steepest declines. As in the East, both early successional species (such as rufous hummingbird and MacGillivray’s warbler) and mature forest species (such as Vaux’s swift and Cassin’s finch) are declining.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Previous timber harvest on the Bitterroot National Forest removed many of the large ponderosa pines and large snags in suitable habitats and reduced habitat quality. Fire suppression allowed Douglas-fir to encroach flammulated owl habitat both within and outside previous harvest units, resulting in higher density stands with smaller diameter trees that also lowered habitat quality.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing Alternative 1.

Indirect Effects

The No Action Alternative would allow existing vegetative trends to continue. Existing trends in bird populations would follow the habitat trends. In the short term, older trees would continue to die as a result of moisture competition and attacks by pathogens. The snags created by continued mortality would provide abundant nesting and foraging habitat for pileated, hairy, and three-toed woodpeckers, and red-breasted nuthatches. The nest cavities created by these birds would in turn be available for secondary cavity nesters such as flammulated, boreal, northern saw-whet, and northern pygmy-owls, and would also provide abundant habitat for birds that nest and feed high in continuous conifer canopies, such as Townsend’s warbler, ruby-crowned and golden-crowned kinglets, Cassin’s vireo, and mountain chickadees (Hutto and Young 1999). Other species that are associated with closed-canopy, mesic forests include hermit thrush, varied thrush, gray jay, Hammond’s flycatcher and northern goshawk (Ibid).

In the long term, this alternative would result in an increased potential for a large, moderate to high severity fire that could remove most of the overstory and understory canopies and create thousands of new snags. These conditions would benefit the bird species that seem to be closely associated with early post fire conditions, such as black-backed, three-toed, and hairy woodpeckers, mountain bluebirds, olive-sided flycatchers, and Townsend's solitaires (Hutto 1995).

While this alternative would benefit some bird species in both the short and long terms, it would not result in a trend towards the range of habitat conditions that occurred historically in this area. Bird species diversity would decline as habitat diversity decreased with the continued loss of more open habitats dominated by ponderosa pine, shrubs or grasses and forbs. Because of this downward trend in habitat diversity, this alternative may reduce the diversity of the bird community in this area in the long term.

Cumulative Effects

Constant monitoring of land birds indicates that the past actions have not affected land birds as a group within the Bitterroot Valley. It is highly probable that management actions have caused alterations in habitat that favored some species over other species but monitoring indicates that land bird species viability as a whole has not been affected. It is predicted that effects of current actions and proposed actions will not affect viability for this group of birds, only the distribution on a geographically small scale.

Alternatives 2, 3, & 4 –Action Alternatives

Direct and Indirect Effects

In the short term, Alternative 2 would open up the canopies of existing relatively closed-canopy, mesic forests over 1,476 acres of commercial timber harvest. The canopies in most of these units are becoming more open as a result of ponderosa pine mortality from mountain pine beetle infestations. Habitat quality for birds strongly associated with closed canopy conditions is declining regardless of treatment. The non-commercial thinning treatment would restore more open stand conditions to 531 acres of dense sapling stands that provide suitable habitat for a few generalist bird species such as juncos. These stands would provide suitable habitat conditions for many more bird species after thinning, especially as the accelerated growth rates produced by thinning produce taller trees with good cone crops.

Alternatives 3 and 4 would cause similar habitat changes over fewer acres. Alternative 3 proposes 1,292 acres of commercial harvest and 924 acres of non-commercial thinning. Alternative 4 proposes 1,115 acres of commercial harvest and 769 acres of non-commercial thinning.

The other treatment types would generally not change habitat conditions enough to produce noticeable changes in the bird communities using those areas in the short term. Alternative 4 would retain most of the closed-canopy, mesic forests conditions that currently dominate the project area, and would thus continue to supply adequate suitable habitat to maintain populations of the bird species associated with those conditions.

The treatments included in these alternatives would improve habitat quality for other bird species that are associated with more open stand conditions because they would reduce the number of trees on these sites, create spaces between the canopies of individual trees, and favor ponderosa pine by removing most of the Douglas-fir. They would reduce the number of snags available for woodpeckers, but would retain snags at levels similar to what these stands supported historically. Bird species associated with more open forest conditions include Williamson's sapsucker, northern flicker, western tanager, yellow-rumped warbler, dusky flycatcher and chipping sparrow (Hutto and Young 1999). These treatments would also improve shrub and native forb growth because they would reduce shading created by continuous conifer canopies. Bird species associated with shrubs

and forbs include orange-crowned warbler, McGillivray's warbler, lazuli bunting, spotted towhee and rufous hummingbird (Ibid).

The low severity prescribed burning following harvest in most units will reduce fuels and preserve most of the trees, shrubs, and other forest vegetation. Land bird species which are not associated with low severity fire regimes will be negatively affected in the short-term. In Unit E (the moderate-to-high severity burn area), trees, shrubs and other vegetation will be killed. Land bird species associated with stand replacing fires, like black-backed woodpeckers, will benefit, while other species will be negatively impacted in the short term.

Intermediate harvest would speed understory shrub layer recovery by releasing nutrients and water used by trees, and by the additional sunlight that reaches the forest floor. Riparian habitat conservation areas will preserve the best shrub habitats in the project area thereby conserving habitat. Overall effects on land birds from implementing the Como Forest Health project would be minor and would not affect species viability.

In the long term, these alternatives would reduce the risk of a large, moderate to high severity fire but would not completely eliminate its potential. The reduction of a potentially moderate to high severity fire would benefit bird species adapted to open, ponderosa pine forests. In the event of this type of fire, species strongly associated with post-fire habitats would benefit from increased habitat.

Overall, these alternatives would increase habitat diversity across the project area, and would result in a trend towards the range of habitat conditions that occurred historically. Bird species diversity would trend towards historic levels with the restoration of more open habitats dominated by ponderosa pine, combined with maintaining portions of the existing closed canopy habitat. This trend towards historic conditions would benefit the bird community as a whole because it would provide more sustainable habitat conditions for an increased number of bird species.

Cumulative Effects

Constant monitoring of land birds indicates that past forest management activities have not affected land birds as a group in the Bitterroot Valley. Management actions have likely changed habitats that favored some species over others, however, monitoring indicates that land bird species viability as a whole has not been affected. Likewise, we predict that effects of Como Forest Health project activities would not affect land bird populations' viability.

The most likely activity to affect land birds in the analysis area would be activities that affect the shrub component, a habitat component of many flycatchers. Although livestock grazing has this potential, management plans and existing operating plans are adequate to maintain shrubs within the project area. The limited number of livestock over large areas is expected to disperse livestock use. Minor localized impacts may occur, but overall quantity of shrubs across the analysis area will not be appreciably affected.

3.3.14.4 Compliance to Regulatory Framework

The land bird monitoring program on the Bitterroot National Forest responds to regulatory direction to maintain viable populations of all native and desired non-native wildlife in habitats distributed throughout their geographic range on National Forest lands. The monitoring program has not revealed declines in any land bird species. However, monitoring has occurred for 20 years, which is a limited basis for definitive conclusions.

President Clinton issued an Executive Order on "Responsibilities of Federal Agencies to Protect Migratory Birds" on January 10, 2001. In direct response to the Executive Order the Forest Service and Fish and Wildlife Service have entered into a Memorandum of Understanding (MOU) to strengthen migratory bird conservation through enhanced collaboration between the Forest Service

and Fish and Wildlife Service, in coordination with state, tribal, and local governments. In support of the Bitterroot Forest's commitment to conservation of migratory birds, the Como Forest Health Project avoided management activities adjacent to the bird banding station and includes design features that would preserve land bird habitat components (Table 2.2-5). Continued coordination with the USFWS will determine actions needed to reduce or eliminate impacts on Neotropical bird species that would affect species' viability.

3.3.14.5 Summary of Effects

Implementation of Alternative 1 would have no direct impact of the populations of forest land birds in the project area, but would most likely decrease habitat diversity over the next 20 years leading to a decrease in bird species diversity in this area of the Forest.

Implementation of Alternatives 2, 3, and 4 would positively affect forest land bird habitat and species diversity by maintaining diverse tree species and forest structures.

3.3.15 Animal Migration, Movement, and Dispersal (Fragmentation and Corridors)

This section analyzes the impact that the proposed activities on animal movement, migration and dispersal. This will be done by considering effects on habitat fragmentation and travel corridors at local and regional scales.

3.3.15.1 Overview of Issues Addressed

Habitat Connectivity

Wildlife populations need to remain connected to other populations in order to promote genetic exchange that enables smaller populations to persist over time. Habitat fragmentation and loss remain the leading worldwide threats to biodiversity and may be further exacerbated by rapid climate change (Lacher and Wilkerson 2014) leading to less connected wildlife populations. Forest habitats in the Como Forest Health project area and across the rest of the Bitterroot National Forest and Region 1 were historically naturally fragmented, and native wildlife populations are adapted to moving through these fragmented landscapes.

Numerous studies (Gruell 1983, Hessburg and Agee 2003, Gallant et al. 2003) show that forests in the Interior Columbia Basin are less fragmented now than they were historically due to fire suppression. This implies that modern forested landscapes should not present a connectivity barrier for native wildlife populations adapted to historically fragmented forested habitats. The wildlife species most likely to become isolated from other populations are those specialized to grassland and shrubland habitats, since those habitats have become reduced in size and distribution with the succession of conifers into formerly open areas (Leiberg 1899, Gruell 1983, Habeck 1994).

3.3.15.2 Affected Environment

Animals move through their habitats in three different ways: daily movements, migrations, and dispersal. Animal movement consists of the daily activity patterns of an animal and how it interacts with its habitat at the local scale. Daily activities depend on contiguous suitable habitat, or at least suitable food, cover and water juxtaposed in a small enough area for daily use.

Migration is the seasonal movement of animals between areas of habitat suitable for summer and winter range (Kendeigh 1961). In most cases, we think of the relatively short migrations of big game between high elevation summer ranges and winter range below high snow accumulation zones, but Neotropical migratory birds spend more time during winter in western Mexico or Central America than they do during breeding season in western Montana. In this analysis, we only have control over

lands involved in the shorter migrations between summer and winter ranges. We have no control over, nor direct effects upon habitats well beyond National Forest boundaries and can only do our best to assure suitable seasonal habitats for sustained productivity.

Dispersal is a one-way, outward movement of individuals from suitable, occupied habitat (Kendeigh 1961). Dispersal movements appear random, almost erratic, and most involve young animals. The dispersal of individuals between wildlife populations is an important component of genetic diversity and adaptability of a species to its habitat. Isolated populations are particularly susceptible to loss of genetic diversity if no movement among populations can occur. It is thought that providing suitable corridors for successful dispersal of at least one individual per generation can help maintain genetic diversity (Morrison et al. 1992). Dispersing individuals often travel through areas of unsuitable habitat in order to reach areas of suitable habitat. A corridor is defined as an area through which species can move from one place to another in response to changes in environment or as a natural part of their life history.

Connectivity is defined as the arrangement of habitats that allow organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of vegetation. The factors affecting habitat connectivity varies by species and effects can be either positive (e.g. populations are not isolated and subject to reduced gene flow) or negative (e.g. the spread of noxious weeds or invasive species). Preliminary work on the Forest Plan Revision in 2005 identified the connectivity probability of the Bitterroot National Forest on the Bitterroot, Flathead, and Lolo National Forests. The revision team assessed relative habitat connectivity across the landscape using roadless and wilderness areas, lynx linkage zones from the interagency lynx committee, and priority linkage habitat from the interagency grizzly bear committee as parameters (PF-WILD-062). The Bitterroot Range heading north into Missoula has good connectivity, except in the area surrounding Lake Como and the project area, which rates out as having poor connectivity probability (Fig. 3.3-37). This is most likely due to high intensity forest management and high use recreation area. Overall, the Bitterroot National Forest has good connectivity for animals moving north and south along the foothills and into the adjacent wildernesses. Highway 93 provides a barrier for animals moving east and west in the Valley bottom and along the Bitterroot River.

On the local project level, animal movement is most likely affected by high recreational traffic in the area, mostly during the summer and fall months. Although there haven't been any major fires recently in the project area, the habitat is patchy and fragmented from previous timber harvests in the area. In the project area, riparian stringers that run east and west provide vegetation corridors for movements. Movement north and south is more fragmented, except on the western side of the project area which borders the roadless area.

Desired Condition

The desired condition for animal migration, movement and dispersal in the project area is to manage vegetation and habitat toward conditions as they existed in the past to provide connectivity and allow movement of desired animals and plants across the Forest and adjacent lands.

3.3.15.3 Environmental Consequences

Spatial Context for Effects Analysis

The defined effects area for animal movement, dispersal and migration is the Bitterroot National Forest. This analysis area is appropriate to analyze the effects since we only have control over and direct effects upon habitats within the National Forest borders that only involve the shorter migrations between summer and winter ranges.

Temporal Context for Effects Analysis

The effects of the fragmentation and patchiness that will result from the proposed activities will last until the canopy cover grows back to the same coverage it was at before the treatment. This will take roughly 50 years in most harvested stands.

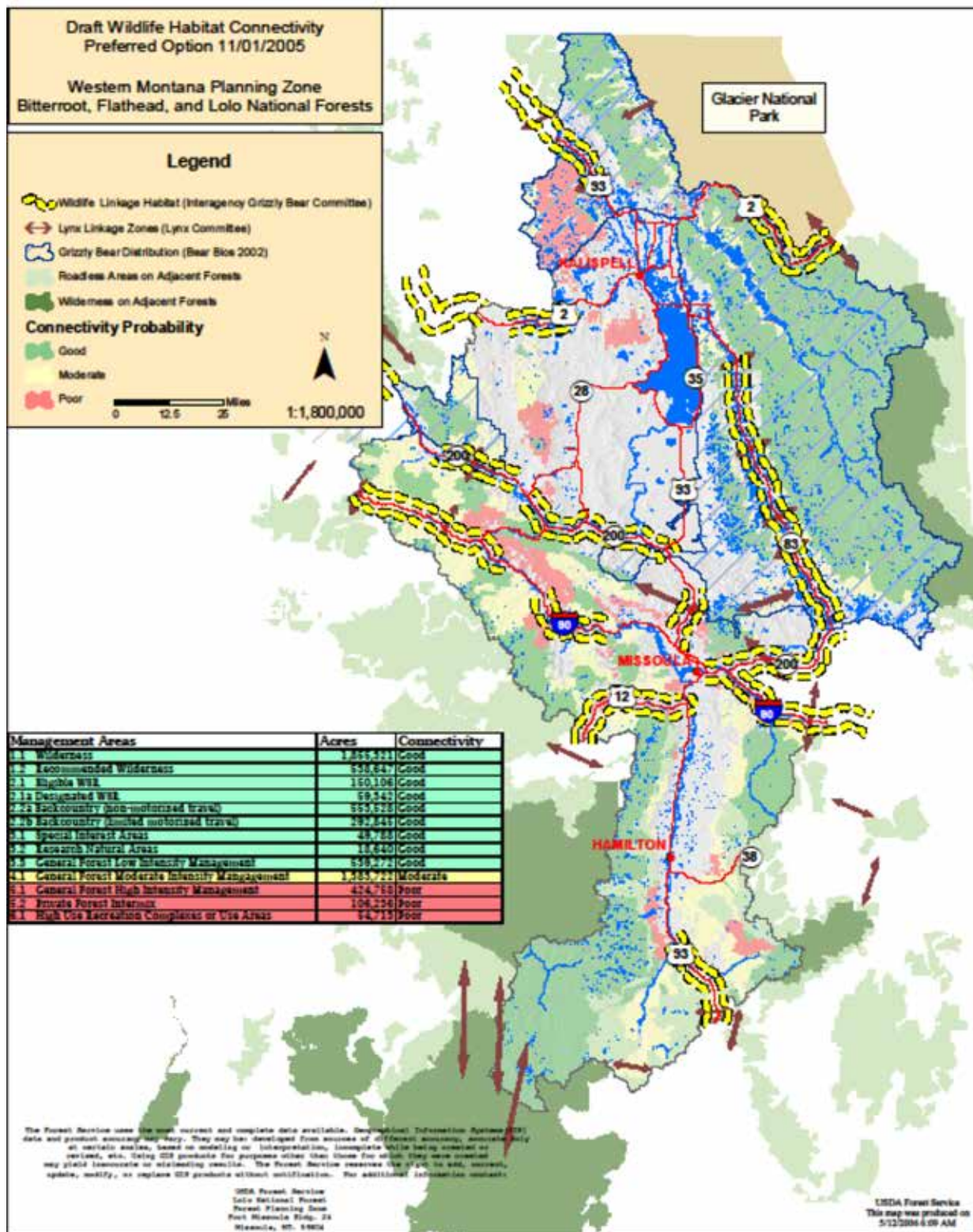


Figure 3.3-36: Wildlife Habitat Connectivity between the Bitterroot, Lolo, and Flathead National Forests

Trends and Broader Context

Forest ecosystems throughout the Inland Northwest, including the Rocky Mountains, were created and maintained by frequent disturbance, principally fire and flooding (Hessburg and Agee 2003).

These disturbances and the extensive topographic variation in the region resulted in naturally patchy forest patterns (Tewksbury et al. 1998). Human alterations of natural disturbance regimes (fire suppression) has resulted in forest patterns today that are much more homogenous and extensive than those prior to Euro-American settlement (Gallant et al. 2003). Hessburg and Agee (2003) report the most widely distributed change in forest structure across the Interior Columbia Basin was sharply increased area and connectivity of intermediate (not new or old) forest structures, and Gruell (1983) states that the most striking change in forests in Region One has been the widespread increase in distribution and density of conifers. Gallant et al. (2003) found in the Greater Yellowstone ecosystem that the primary forest dynamic in the study area is not the fragmentation of conifer forest by logging, but the transition from a fire-driven mosaic of grasslands, shrub land, broadleaf forest, and mixed forest communities to a conifer-dominated landscape. Area of conifer-dominated landscapes increased from 15% of their study area in 1856 to 51% in 1996, while area dominated by aspen and grasslands declined by 75% and 40% respectively, during this period. Similar patterns of conifer encroachment into grasslands and shrub lands have been documented by many others (Leiburg 1899, Gruell 1983, Habeck 1994). As a result of these changes, more forest exists today in the northern Rockies than at any time since European settlement (Samson 2006).

Much of the scientific literature that describes the effects of habitat fragmentation to wildlife species is based on studies in areas that originally supported large, homogeneous areas of relatively stable late successional forests, such as the eastern United States, the Pacific Northwest or the Amazon (Wilcove et al. 1986). The effects of fragmentation on wildlife species documented in these areas probably do not apply to the Inland Northwest, where ecosystems were created and maintained by frequent disturbance events that resulted in a high degree of forest fragmentation.

Disturbance and resulting habitat fragmentation are natural parts of forest ecosystems in our area, and native wildlife species are adapted to dynamic ecosystems. Many organisms have adapted to localized fire regimes and are dependent upon either early or late seral habitats (Hutto 1995). Species breeding in ecosystems where frequent small and large-scale natural disturbances have occurred historically may be more resistant to habitat changes (Schmiegelow et al. 1997), and are less affected by habitat fragmentation (Samson 2006).

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

The existing condition represents the sum of past activities. Native wildlife species have evolved in a landscape with a high degree of fragmentation, abundant edge and relatively small patch sizes, the result of natural processes and topography. Over the past century the Bitterroot National Forest landscape has not been appreciably altered by any past actions on the landscape except for perhaps high volume road systems, and fire suppression. Highway 93 is the only road that appears to have affected wildlife. Effects of fragmentation on wildlife dispersal or movement between various habitat elements (water, forage, winter/summer range, breeding areas) has not affected the viability of any wildlife species on the Forest as discussed in each of the specific species narratives in this chapter.

Alternative 1 – No Action

Direct Effects

There are no direct effects of choosing the no action alternative.

Indirect Effects

The No Action Alternative would allow the density and distribution of conifers to continue increasing, moving the landscape farther from historical conditions. Wildlife species that travel through thick, continuous cover will benefit, while species that have adapted to using edges and patchy landscapes will not do as well. The wildlife species most likely to become isolated from other

populations are grassland and shrubland habitat specialists since those habitats have become reduced in size and distribution with the invasion of conifers into formerly open areas (Leiburg 1899, Gruell 1983, Habeck 1994). This situation would be reduced in the event of a large, moderate to high severity fire in which the area or large portions of it are converted to grass or shrubland.

Cumulative Effects

Cumulative effects are limited and speculative since there are no direct effects and indirect effects are limited.

All Action Alternatives

Design Features and Mitigation Measures

The design features protecting riparian habitat are the same for all of the Action Alternatives (Table 2.2-5) and are explained in the Fisheries section.

Direct and Indirect Effects

All of the alternatives would retain most forest cover where it currently exists throughout the project area in the short term. All alternatives would reduce tree stocking levels and the density of forest canopies in many of the units, but the treated stands would be similar to forest stands that occurred in this area under historic disturbance processes. The biggest difference among the alternatives is Unit E, which will be burned in Alternatives 2 and 3 but not Alternative 4. A moderate to high severity fire is being proposed in Unit E, and has the potential to create a 2-mile wide patch with minimal vegetation. As documented in the Canada Lynx section of this report (Section 3.3.3), this large patch would reduce lynx habitat connectivity and decrease the ability of transient lynx to move across the Bitterroot Mountains. While patches of this size could have occurred historically from natural disturbance processes, the probability of such a large-scale event is low.

Treating Unit E would also require over 2 miles of a 20-foot wide fuel break along the western and northern unit boundaries in order to contain the proposed burn within the unit. This fuel break would create a linear feature in a mature forest stand that interrupts the forest cover and creates a corridor for movement of some plant and animal species into areas from which they may have been previously excluded. In this situation, an open corridor would facilitate the movements of lynx competitors, such as coyotes, wolves and bobcats, which would have a negative effect for lynx.

The aspen treatments in Alternative 4 would create continuous stringers of aspen and cottonwood habitat along the riparian corridors in the project area. The treatments will improve wildlife habitat connectivity for travel, foraging, and hiding.

None of the proposed activities would alter landscapes beyond the range of natural variation; therefore none of the activities would substantially interrupt existing animal movement and dispersal patterns.

New roads would be built in Alternatives 2 and 4, but forest roads generally do not present a barrier to movement or dispersal for wildlife species. The roads built will not be open for use after project implementation, lessening their potential effect on animal movement or dispersal. Some species may change their movement patterns in response to the reduction of forest canopies, but the treatments would not prohibit movements between or within forested landscapes.

Cumulative Effects

The impacts of management activities proposed in the action alternatives are expected to have minimal effect on the migration, movements, or dispersal of wildlife populations on the Forest. The effects of removing mature, multistoried forest (i.e., Unit E) are amplified when previous disturbances in adjacent stands are considered. The history of large fires and their subsequent re-

growth in the Como analysis area, and on the Bitterroot National Forest as a whole, have created a mosaic of vegetative structure across the landscape. The effects of the proposed management treatments will augment the variation of habitat fragmentation, moving conditions closer to those created by disturbance regimes typical for the Bitterroot National Forest.

3.3.15.3 Summary of Effects

None of the alternatives would substantially interfere with migration, movements, or dispersal of wildlife populations, though individual animals may be disturbed. All proposed actions are predicted to move vegetation towards historical patterns and vegetative structure across the project area. Canada lynx movements may be inhibited or they may be exposed to competition from other animals if Unit E is burned.

3.3.16 Biological Evaluation and Biological Assessment of Threatened, Endangered, and Sensitive Species

3.3.16.1 Summary of Conclusions

PROJECT NAME: COMO FOREST HEALTH PROJECT				
T & E SPECIES	ALT. 1	ALT. 2	ALT. 3	ALT. 4
Canada Lynx	NE	NLAA	NLAA	NE
Yellow-billed Cuckoo	NE	NE	NE	NE
SENSITIVE SPECIES	ALT. 1	ALT. 2	ALT. 3	ALT. 4
Bald Eagle	NI	NI	NI	NI
Bighorn Sheep	NI	NI	NI	NI
Black-backed Woodpecker	NI	MIH	MIH	MIH
Coeur d'Alene Salamander	NI	NI	NI	NI
Fisher	NI	MIH	MIH	MIH
Flammulated Owl	NI	MIH, BI	MIH, BI	MIH, BI
Gray Wolf	NI	NI	NI	NI
Long-eared Myotis	NI	MIH	MIH	MIH
Long-legged Myotis	NI	MIH	MIH	MIH
Northern Bog Lemming	NI	NI	NI	NI
Northern Leopard Frog	NI	NI	NI	NI
Peregrine Falcon	NI	NI	NI	NI
Western Big-eared Bat	NI	MIH	MIH	MIH
Western Toad	NI	MIH	MIH	MIH
Wolverine	NI	MIH	MIH	MIH
NE = No Effect, NLAA = Not likely to adversely affect, LAA = Likely to adversely affect, NI = No Impact, MIH = May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species, LIFV = Likely to Impact Individuals or Habitat with a Consequence that the Action May Contribute Towards Federal Listing or Result in Reduced Viability for the Population or Species, BI = Beneficial Impact				

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